

**TECHNICAL MANUAL
FOR
OVEN, BLODGETT
MODEL HV100-EM
INSTALLATION, OPERATION, AND MAINTENANCE
PROCEDURES**



SUPERSEDURE NOTICE: THIS MANUAL SUPERSEDES S6163-CY-FSE-010,
DATED 15 OCTOBER 2009, AND ALL CHANGES THERETO.

DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

PUBLISHED BY DIRECTION OF COMMANDER, NAVAL SEA SYSTEMS COMMAND



19 JUL 2012

TECHNICAL MANUAL CERTIFICATION SHEET

CERTIFICATION APPLIES TO:

NEW MANUALS

☐

REVISION

☐

CHANGE

☐

APPLICABLE TMINS/PUB. NO.

PUBLICATION DATE (day, month, year)

READING GRADE LEVEL (RGL)

TITLE

TMCR/TMSR/SPECIFICATION NUMBER

CHANGES AND REVISIONS:

PURPOSE

EQUIPMENT ALTERATION NUMBERS INCORPORATED

TMDER/ACN NUMBERS INCORPORATED

Continued on additional pages as needed.

CERTIFICATION STATEMENT

This is to certify that responsible Navy activities have reviewed the above identified document for acquisition compliance, technical coverage and printing quality. This form is for internal Government management use only and does not imply contractual approval or acceptance of the technical manual by the Government nor does it relieve the contractor of any responsibilities for delivering the technical manual in accordance with the contract requirements.

ACQUISITION	NAME	SIGNATURE	ORGANIZATION	CODE	DATE
TECHNICAL	NAME	SIGNATURE	ORGANIZATION	CODE	DATE
PRINTING RELEASE	NAME	SIGNATURE	ORGANIZATION	CODE	DATE

S6163-CY-FSE-010
19 July 2012

IDENTIFYING TECHNICAL PUBLICATION SHEET FOR COMMERCIAL MANUAL

This manual supersedes S6163-CY-FSE-010, dated 15 October 2009, and all changes thereto.

1. PURPOSE: This technical publication sheet is issued for the purpose of identifying and authorizing the following commercial manual for Navy use.

Manufacturer: G.S. Blodgett Corporation
DBA Blodgett Oven Co.
44 Lakeside Ave.
Burlington, VT 05401-5242
Cage 07695

Purchase Order or Contract No.: N/A
Requisition No.: N/A
Equipment: HV-100EM Convection Oven with Moisture
National Stock Number: 0910-LP-111-7373
Title: Technical Manual for Oven, Blodgett, Model HV100-EM; Installation, Operation, and Maintenance Procedures
Additional Identification: N/A
Date: 19 July 2012

2. ADDITIONAL COPIES: Additional copies are available from the Naval Logistics Library (NLL).

3. FILE LOCATION: The above-described commercial manual is filed in _____.

4. AUTHORITY NOTICE AND DISTRIBUTION STATEMENT:

Published by direction of Commander, Naval Sea Systems Command.

Distribution Statement A: Distribution Approved for public release, distribution is unlimited.

FOR UNCLASSIFIED MANUALS

NOTICE: Reproduction for non-military use of the information or illustration in this publication is not permitted. The policy for military use reproduction is established in OPNAVINST 5510.1B.

This material may be reproduced by or for the U.S. Government pursuant to the rights acquired under Article 39 of Newport News Shipbuilding Purchase Order DoD Contracts Appendix A dated June 2010.

RECORD OF REVISIONS

REV NO.	DATE	TITLE AND/OR BRIEF DESCRIPTION/PREPARING ACTIVITY
0	15 OCT 2009	ORIGINAL PUBLICATION OF MANUAL.
1	19 JUL 2012	UPDATED TO MOST RECENT BLOGETT OVEN TECHNICAL MANUAL.

NOTE

FOR OPTIMAL VIEWING OF THIS TECHNICAL MANUAL THE PAGE LAYOUT IN ADOBE ACROBAT READER SHOULD BE SINGLE PAGE. CONTINUOUS PAGE DISPLAY CAN CAUSE PROBLEMS WITH LINK REFERENCES AND THE BOOKMARKS.

FOREWORD

This technical manual provides installation, operation, and maintenance procedures for the Blodgett Oven, Model HV-110E. This technical manual is intended for guidance of and use by personnel operating and maintaining the equipment described herein.

This manual consists of four chapters as follows:

- Introduction
- Installation
- Operation
- Maintenance

Ships, training activities, supply points, depots, Naval Shipyards and Supervisors of Shipbuilding are requested to arrange for the maximum practical use and evaluation of NAVSEA technical manuals. All errors, omissions, discrepancies and suggestions for improvement to NAVSEA technical manuals shall be forwarded to:

COMMANDER
CODE 310 TMDERs
NAVSURFWARCENDIV NSDSA
4363 MISSILE WAY BLDG 1389
PORT HUENEME, CA 93043-4307

on NAVSEA/SPAWAR Technical Manual Deficiency/Evaluation Report (TMDER), NAVSEA form 4160/1. All feedback comments shall be thoroughly investigated and originators will be advised of action resulting therefrom. One copy of NAVSEA form 4160/1 is at the end of each separately bound technical manual 8-1/2 x 11 inches or larger. Copies of NAVSEA form 4160/1 may be requisitioned from the Naval Systems Data Support Activity Code 310 at the above address. Users are encouraged to transmit deficiency submittals via the Naval Systems Data Support Activity Web site located at:

https://mercury.tdmis.navy.mil/def_external/pubsearch.cfm

SAFETY SUMMARY

GENERAL SAFETY NOTICES

The following general safety notices supplement the specific warnings and cautions appearing elsewhere in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered herein. Should situations arise that are not covered in the general or specific safety precautions, the commanding officer or other authority will issue orders as deemed necessary to cover the situation. No work shall be undertaken on energized equipment or circuits until approval of the commanding officer is obtained, and then only in accordance with Naval Ships' Technical Manual (NSTM) S9086-KC-STM-010/Chapter 300.

DO NOT REPAIR OR ADJUST ALONE

Under no circumstances shall repair or adjustment of energized equipment be attempted alone. The immediate presence of someone capable of rendering first aid is required. Before making adjustments, be sure to protect against grounding. If possible, adjustments should be made with one hand, with the other hand free and clear of equipment. Even when power has been removed from equipment circuits, dangerous potentials may still exist due to retention of charges by capacitors. Circuits must be grounded and all capacitors discharged prior to attempting repairs. Equipment should be deenergized and properly tagged out according to the ship's Standard Operating Procedures.

TEST EQUIPMENT

Make certain test equipment is in good condition. If a metal-cased test meter must be held, ground the case of the meter before starting measurement. Do not touch live equipment or personnel working on live equipment while holding a test meter. Do not ground any measuring devices; these devices should not be held when taking measurements.

INTERLOCKS

Interlocks are provided for safety of personnel and equipment and should be used only for the purpose intended. They should not be battle shorted or otherwise modified except by authorized maintenance personnel. Do not depend solely upon interlocks for protection. Whenever possible, disconnect power at the power distribution source.

MOVING EQUIPMENT

Personnel shall remain clear of moving equipment. If equipment requires adjustment while in motion, a safety watch shall be posted. The safety watch shall be qualified to administer CPR, have a full view of the operations being performed, and have immediate access to controls capable of stopping equipment motion.

FIRST AID

An injury, no matter how slight, shall never go unattended. Always obtain first aid or medical attention immediately, and file an injury report in accordance with OPNAVINST 5102.1 series, subj: Mishap Investigation and Reporting.

SAFETY SUMMARY - Continued**RESUSCITATION**

Personnel working with or near high voltage shall be familiar with approved methods of resuscitation. Should someone be injured and stop breathing, begin resuscitation immediately. A delay could cost the victim's life. Resuscitation procedures shall be posted in all electrically hazardous areas.

FINGER RINGS/JEWELRY

Finger rings have caused many serious injuries. Remove rings, watches and other metallic objects that may cause shock or burn hazards. Unless specifically allowed by shop safety procedures, remove finger rings and jewelry during all maintenance activity.

COMPRESSED AIR

Do not use compressed air for general cleaning. Compressed air may be used only for cleaning of electric motors. Use of compressed air can create an environment of propelled particles. Do not direct air streams toward self or other personnel. Air pressure shall be reduced to less than 30 psig and used with effective chip guarding and personal protective equipment.

DANGEROUS PRESSURES

Care must be taken to ensure that all pressurized connections are proper and tight. All system components must be compatible with pressure applied. During testing protect personnel with safety shields or keep them at a distance sufficient to prevent injury.

SPRING LOADED MECHANISM

A spring loaded mechanism can cause injury if released in an uncontrolled manner. Always take extra care when disassembling this type of mechanism.

DO NOT SERVICE OR ADJUST ALONE

Do not attempt internal service or adjustment of equipment unless another person capable of rendering aid and resuscitation is present.

LIFTING AND HANDLING

Use adequate personnel or appropriately rated lifting and handling devices to move these components.

LOCKOUT/TAGOUT

Personnel shall be aware of the hazards associated with unguarded machinery parts, capacitors, gaseous and wet pipe systems, spring loaded devices, etc. Lockout/tagout the energy source prior to performing maintenance, adjustments or other procedures that would bypass safety guards, barriers or otherwise expose personnel to hazardous energy sources. Any equipment, machine or process that could unexpectedly energize, startup or release energy will be equipped with a means to lockout/tagout the energy source. Electrical, pneumatic and

SAFETY SUMMARY - Continued

hydraulic controls shall be tagged DANGER – DO NOT OPERATE prior to maintenance procedures. Lockout/tagout procedures shall be in accordance with current shipboard instructions.

APPROVED LUBRICANTS

Use only approved lubricants as specified in this manual. Other lubricants are inadequate and can cause failure of system components, resulting in personnel injury and equipment damage.

OPERATOR TRAINING

Operators must be familiar with all controls, indicators and component parts of the equipment and all Warnings and Cautions before performing any operation or maintenance.

HAZARDOUS MATERIALS

Warnings for hazardous material are designed to warn personnel of hazards associated with such items when they come in contact with them during actual use. For each hazardous material used, a Material Safety Data Sheet (MSDS) is required to be provided and available for review by users. Consult your local safety and health staff concerning any questions on hazardous chemicals, MSDSs, personal protective equipment requirements and handling and emergency procedures.

GENERAL PRECAUTIONS

The following general precautions are to be observed at all times.

1. Install and ground all electrical components associated with this system/equipment in accordance with applicable Navy regulations and approved shipboard practices.
2. Ensure that all maintenance operations comply with Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19 series.
3. Observe precautions set forth in NSTM S9086-KC-STM-010/Chapter 300 with respect to electrical equipment and circuits.
4. Ensure that protective guards and shutdown devices are properly installed and maintained around rotating parts of machinery and high voltage sources.
5. Do not wear loose clothing while working around rotating parts of machinery.
6. Ensure that special precautionary measures are employed to prevent applying power to the system/equipment any time maintenance work is in progress.
7. Do not make any unauthorized alterations to equipment or components.
8. Before working on electrical system/equipment, use the correct tag out procedure and check with voltmeter to ensure that system is not energized.
9. Consider all circuits not known to be "dead," "live" and dangerous at all times.
10. When working near electricity, do not use metal rules, flashlights, metallic pencils, or any other objects having exposed conducting material.
11. Deenergize all equipment before connecting or disconnecting meters or test leads.

SAFETY SUMMARY - Continued

12. When connecting a meter to terminals for measurement, use range higher than expected voltage.
13. Before operating equipment or performing any tests or measurements, ensure area is dry of water or other liquid conductive material and that frames of all motors and starter panels are securely grounded.
14. Ensure that area is well-ventilated when using cleaning compound or solvent. Avoid prolonged breathing of fumes and compound or solvent contact with skin or eyes.



HV-100EM

CONVECTION OVEN WITH MOISTURE INSTALLATION – OPERATION – MAINTENANCE



BLODGETT OVEN COMPANY

www.blodgett.com

44 Lakeside Avenue, Burlington, Vermont 05401 USA Telephone (802) 658-6600 Fax: (802)864-0183

PN 51702 Rev F (11/10)

© 2010 – G.S. Blodgett Corporation



THE REPUTATION YOU CAN COUNT ON

For over a century and a half, The Blodgett Oven Company has been building ovens and nothing but ovens. We've set the industry's quality standard for all kinds of ovens for every foodservice operation regardless of size, application or budget. In fact, no one offers more models, sizes, and oven applications than Blodgett; gas and electric, full-size, half-size, countertop and deck, convection, Cook'n Hold, Combi-Ovens and the industry's highest quality Pizza Oven line. For more information on the full line of Blodgett ovens contact your Blodgett representative.

IMPORTANT

WARNING: IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH. READ THE INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING OR SERVICING THIS EQUIPMENT

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.

The information contained in this manual is important for the proper installation, use, and maintenance of this oven. Adherence to these procedures and instructions will result in satisfactory baking results and long, trouble free service. Please read this manual carefully and retain it for future reference.

Errors: Descriptive, typographic or pictorial errors are subject to correction. Specifications are subject to change without notice.

Your Service Agency's Address:



Model:

Serial Number

Your appliance was installed by

Your oven's installation was checked by

Table of Contents

Introduction

Oven Description and Specifications	2
---	---

Installation

Agency Approvals	3
Oven Location and Shipping	4
Ventilation	5
Oven Assembly	6
Supply Water and Plumbing	10
Electrical Supply	11

Operation

MenuSelect™ Control	12
---------------------------	----

Maintenance

Spray Bottle Operating Procedure	18
Cleaning and Preventive Maintenance	19
Replacement Parts	21
Second Level Programming	29
Troubleshooting	31
Sequence of Operation	33
Component Resistance Readings	35
Probe Ohms Chart	36



Introduction

Oven Description and Specifications

Blodgett ovens are quality produced using high-grade stainless steel with first class workmanship.

The multiple speed fan, which is guarded against accidental finger contact, is driven by a quiet and powerful motor. The condenser draws out excess moisture from the appliance. Condensation and waste water, which result during hydro cooking and cleaning, are continuously drained.

The use of high quality insulation impedes excessive heat radiation and saves energy.

The HV-100EM has legs which adapt easily to slightly uneven surfaces.

The practical oven doors, with viewing windows, have a wide swing radius and handle which can be operated easily, even with wet or greasy hands.

Ease of operation is guaranteed through the simple arrangement of the controls. Graphic symbols make the appliance easy for even inexperienced kitchen staff to operate. The Cool Down mode, allows the oven cavity to cool down rapidly with the door opened.

Cleaning is kept to a minimum. The interior is sprayed with a self-acting cleaning solution which interacts with humidity to easily remove crusts and stains. The oven is designed for easy care and is welded water tight so that the internal cooking cavity may be rinsed with a hose after the cleaning process.

ELECTRIC SPECIFICATIONS

Voltage	Hz	kW	Phase	Max Load (amps)			Motor
				L1	L2	L3	
440	60	15	3	20	18	18	1/2 HP 208-240VAC, 50/60 Hz

PLUMBING SPECIFICATIONS

WATER	
Supply Water Pressure	30 PSI (207 kPa) minimum 50 PSI (345 kPa) maximum
Water Connection	3/4" garden hose – Cold water only
Internal Water Pressure Regulator Setting	Preset to 20 PSI (138 kPa) Flow rate of 4 GPH
Minimum Requirements	TDS – less than 100 parts per million Total Hardness – 80-120 parts per million Chlorides – less than 30 parts per million Chlorine – 0 parts per million pH Factor – 7.0-8.0
DRAINAGE	
Drain Type	Atmospheric Vented Drain
Drain Connection	1" NPT Male



Agency Approvals

THE INSTALLATION INSTRUCTIONS CONTAINED HEREIN ARE FOR THE USE OF QUALIFIED INSTALLATION AND SERVICE PERSONNEL ONLY. INSTALLATION OR SERVICE BY OTHER THAN QUALIFIED PERSONNEL MAY RESULT IN DAMAGE TO THE OVEN AND/OR INJURY TO THE OPERATOR.

Qualified installation personnel are individuals, a firm, a corporation, or a company which either in person or through a representative are engaged in, and are responsible for:

- The installation or replacement of gas piping. The connection, installation, repair or servicing of equipment.
- The installation of electrical wiring from the electric meter, main control box or service outlet to the electric appliance.

Qualified installation personnel must be experienced in such work, be familiar with all precautions required and have complied with all requirements of state or local authorities having jurisdiction.

U.S. and Canadian Installations

Reference: *National Electrical Code, ANSI/NFPA 70—Latest Edition and/or Canadian Electrical Code CSA C22.1* as applicable.

This equipment is to be installed in compliance with the *Basic Plumbing Code of the Building Officials and Code Administrators International Inc. (BOCA)* and the *Food Service Sanitation Manual of the Food and Drug Administration (FDA)*.

Appliance is to be installed with backflow prevention in accordance with applicable federal, province and local codes.

General Export Installations

Installation must conform with Local and National installation standards. Local installation codes and/or requirements may vary. If you have any questions regarding the proper installation and/or operation of your appliance, please contact your local distributor. If you do not have a local distributor, please call Blodgett Combi at 0011-802-860-3700.





Installation

Oven Location and Shipping

OWNER'S RESPONSIBILITIES

Installation responsibilities prior to service startup inspection

You are entitled to a free start-up inspection service by our factory ASAP. Before a factory representative arrives to perform a startup procedure, the owner must already have satisfied the following requirements.

1. Oven(s) are uncrated, stacked (if applies) and put in place.

NOTE: Please refer to Leg Attachment and Stacking.

Maximum shelf loading – 60 lbs (27.3 Kg)

OVEN LOCATION

The well planned and proper placement of your oven will result in long term operator convenience and satisfactory performance.

Certain minimum clearances must be maintained between the oven and any combustible or non-combustible construction.

- Oven body sides – 0" (0cm)
- Oven body back – 6" (152.4cm)

In addition, the following clearances are recommended for servicing.

- Oven body sides – 12" (30cm)
- Oven body back – 12" (30cm)

SHIPPING

NOTE: The following parts are shipped with the oven.

Part #	Description	Qty.
R10955	Cleaning spray bottle	1
33136	Power cord	2
52723	Drain elbow connection	2
52724	5' drain hose	1
R2207	Hose clamp	4
R10889	10' water hose	1
52728	3' water hose	1
52596	Water manifold	1
52713	Utility box	1
52734	Utility line retainer bracket	1
52715	Vent extension bracket	1
52349	Cavity vent extension	1
52648	4" vent extension hose	1
33196	Seismic legs, set	1
315	1/2-13 x 3/4" stacking bolts	4
34907	Kit, set of ship deck legs	1



VENTILATION

The necessity for a properly designed and installed ventilation system cannot be over emphasized. The ventilation system will allow the unit to function properly while removing unwanted vapors and products of combustion from the operating area.

The appliance must be vented with a properly designed mechanically driven exhaust hood. The hood should be sized to completely cover the equipment plus an overhang of at least 6" (15 cm) on all sides not adjacent to a wall. The capacity of the hood should be sized appropriately and provisions made for adequate makeup air.



WARNING!!

Failure to properly vent the oven can be hazardous to the health of the operator; and will result in operational problems, unsatisfactory baking, and possible damage to the equipment. Damage sustained as a direct result of improper ventilation

will not be covered by the Manufacturer's warranty.

When installed in the Commonwealth of Massachusetts, this appliance must be interlocked with the hood exhaust system so that the appliance may be operated only when the hood exhaust system is running.

U.S. and Canadian Installations

Refer to your local ventilation codes. In the absence of local codes, refer to the National ventilation code titled, *"Standard for the Installation of Equipment for the Removal of Smoke and Grease Laden Vapors from Commercial Cooking Equipment"*, NFPA-96- Latest Edition.

General Export Installations

Installation must conform with Local and National installation standards. Local installation codes and/or requirements may vary. If you have any questions regarding the proper installation and/or operation of your unit, please contact your local distributor. If you do not have a local distributor, please call Blodgett at 0011-802-860-3700.



Installation

Oven Assembly

POSSIBLE LEG BOLTING PATTERNS

There are two leg mounting options. See Figure 1.

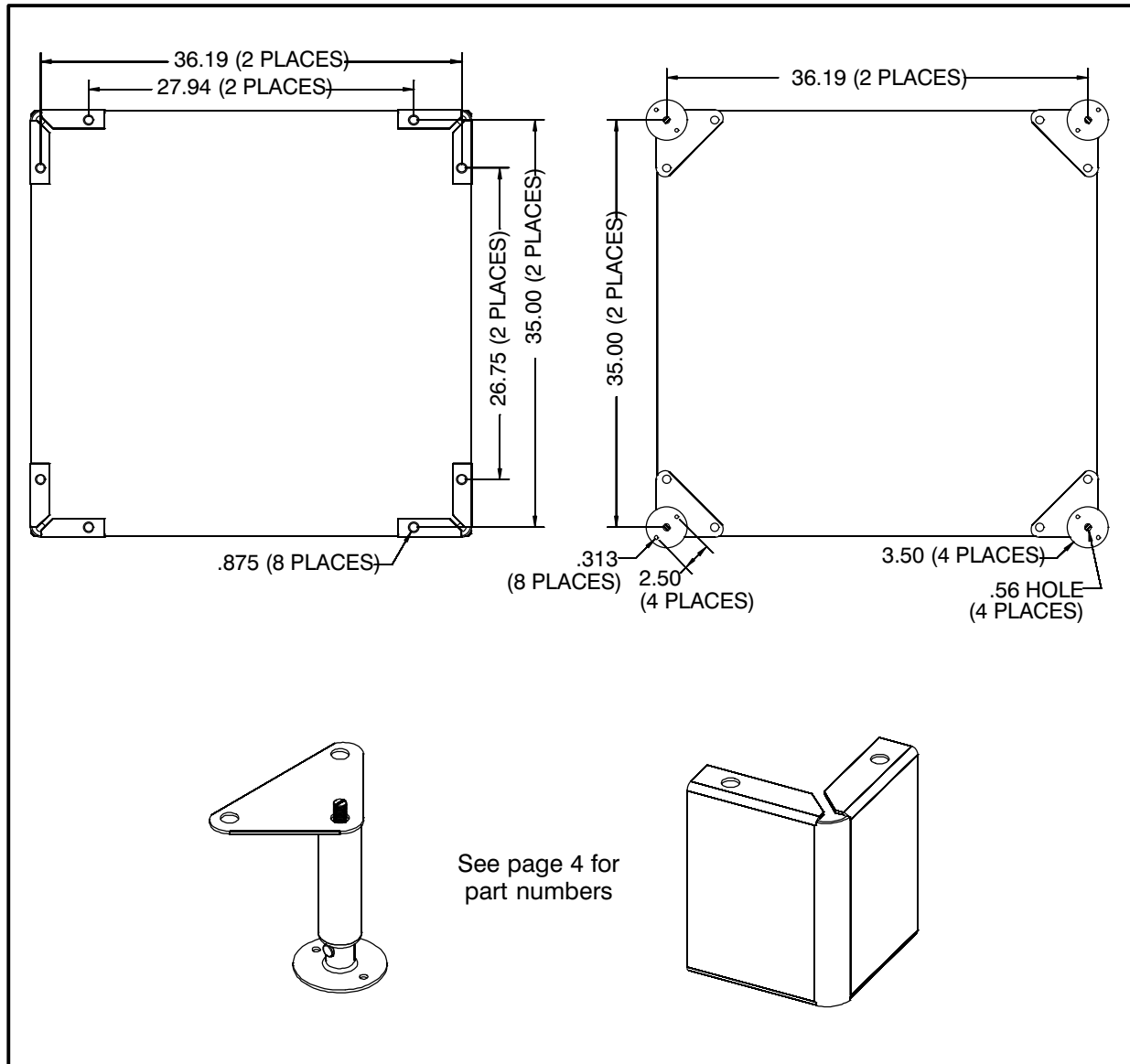


Figure 1



Oven Assembly

LEG ATTACHMENT

1. Align the threaded stud on the right front leg to the bolt hole located in the bottom corner of the oven. Turn the leg clockwise and tighten to the nearest full turn.
2. Align the leg plate holes with the bolt holes.

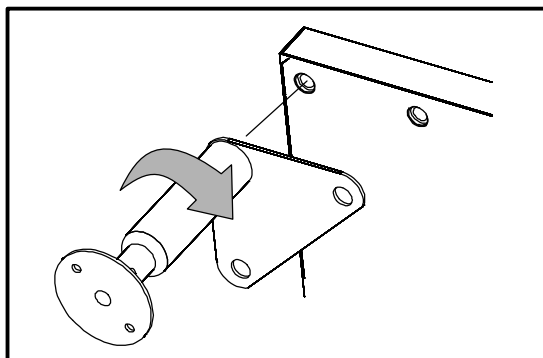


Figure 2

3. **Install the utility box before securing the right front leg.** Align the holes in the utility box bracket to the holes in the leg plate. See Figure 3.
4. Secure the leg and utility box with the two 3/4" bolts provided.

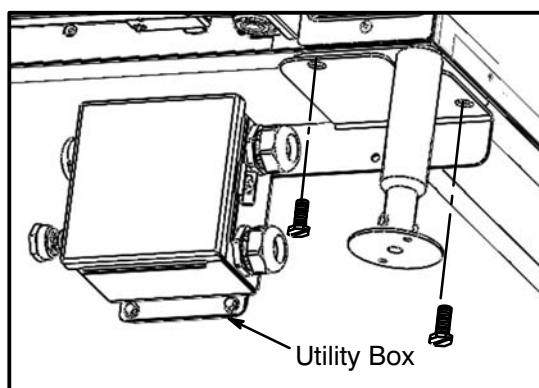


Figure 3

5. Repeat steps 1, 2 and 4 with the left front leg.

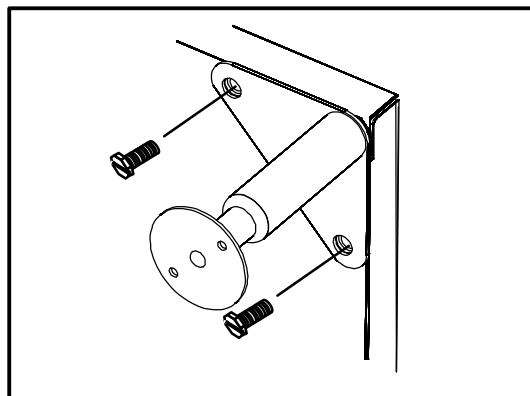


Figure 4

6. Tip the oven up on the newly installed front legs.
7. Repeat the above steps for the right rear leg. **Install the retainer bracket before securing the right rear leg.** Align the holes in the retainer bracket to the holes in the right leg plate. See Figure 5.
8. Secure the leg and retainer bracket with the two 3/4" bolts provided.

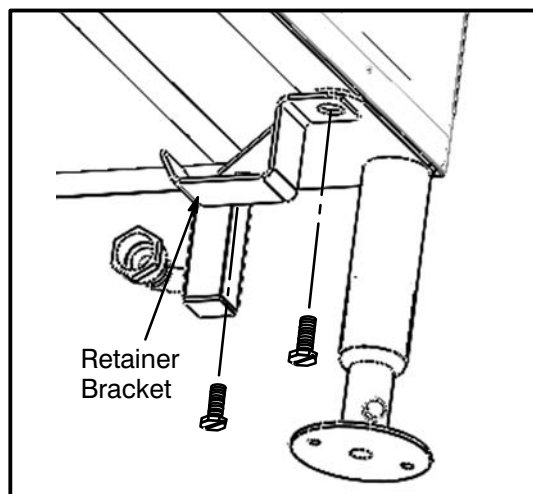


Figure 5

9. Install the left rear leg.
10. Tip the oven onto the feet and place in position. Level the oven by screwing the adjustable feet in or out as necessary.



Installation

Oven Assembly

OVEN STACKING

1. Place the upper oven on top of the lower oven.
2. Bolt the two ovens together from behind using the stacking brackets.

UTILITY CONNECTIONS

NOTE: Refer to Figure 6 for location of utility connection on the back of the ovens.

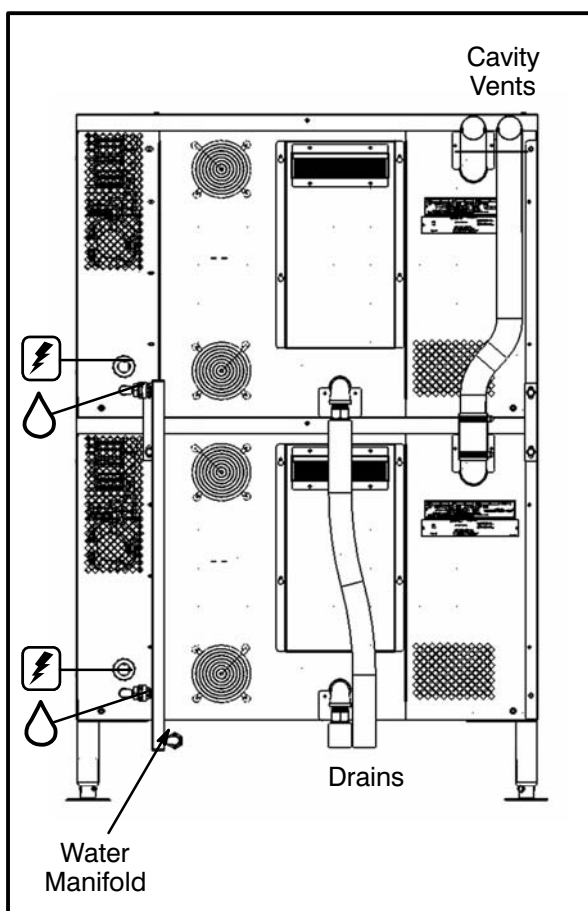


Figure 6

Electrical

1. Remove the two screws from above and below the control panel. Slide the panel out to access the terminal blocks. Refer to page 7.

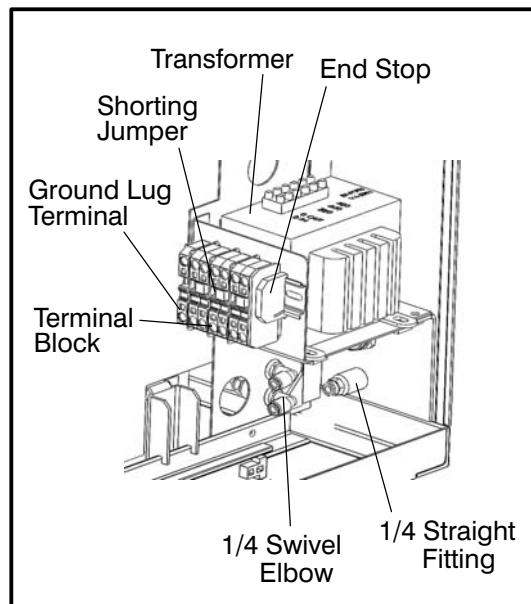


Figure 7

2. Connect the power cord to the top unit. Run the cord down the back of the oven, using the provided strain relief.
3. Then route the cord under the oven, supporting it on the retainer bracket on the rear right leg. Connect to the top right receptacle on the utility box at the front of the oven. See Figure 8.
4. Connect the power cord to the bottom unit. Run the cord down the back of the oven, using the provided strain relief.
5. Then route the cord under the oven, supporting it on the retainer bracket on the rear right leg. Connect to the bottom right receptacle on the utility box at the front of the oven. See Figure 8.



Oven Assembly

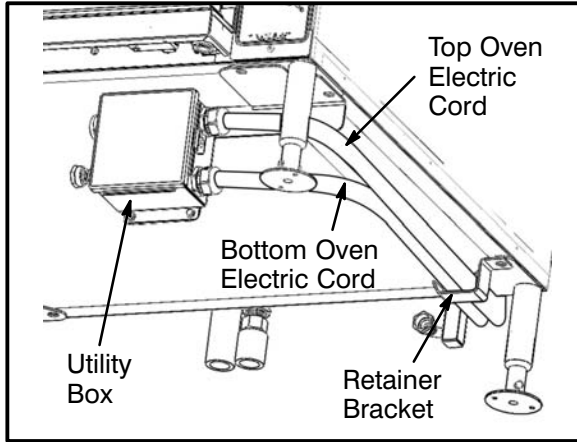


Figure 8

6. Reattach the right side panels once the electrical connections are complete.

Water and Drain

1. Attach the water manifold to the back of the ovens.
2. Attach the short water hose from the water manifold to the utility box underneath the oven.

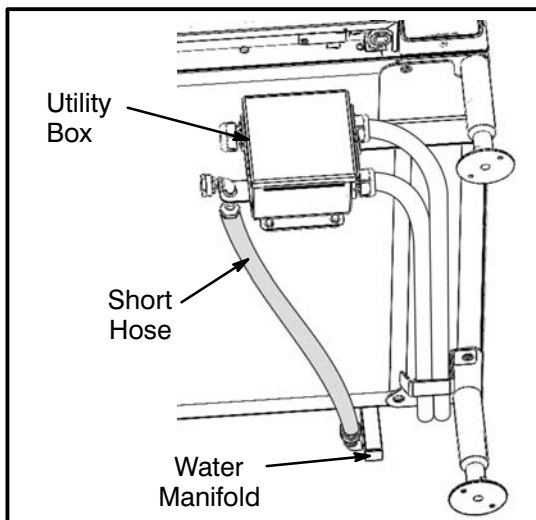


Figure 9

3. Attach the supplied elbow assembly to the oven drain outlet on both units.
4. Attach the supplied drain hose to the top unit. Cut for proper length into the funnel drain. Use the remaining piece of hose for the bottom oven if necessary. See Figure 6 for location of drain connection on back of ovens.

Cavity Vent Extension

1. Attach the cavity vent extension using the silicon tubing and two clamps provided.
2. Remove the existing screw and use it to secure the top section in the bracket. The tabs on the bracket will deflect for a secure fit.

Utility Supply Connection

1. Connect incoming power from the ship to the electrical connection on the utility box underneath the oven. See Figure 10.
2. Connect the cold water supply from the ship to the incoming water connection on the utility box underneath the oven. A 10' water hose is supplied for your convenience. See Figure 10.

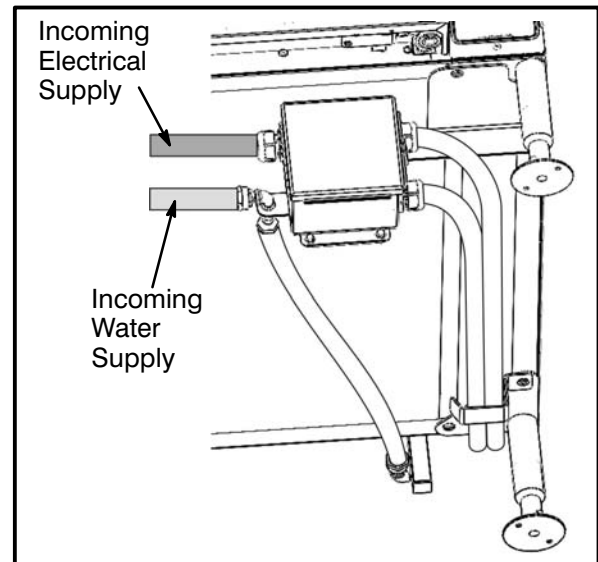


Figure 10



Installation

Supply Water and Plumbing

WATER CONNECTION

NOTE: Must use COLD WATER ONLY.

A shut off valve is to be provided adjacent to the oven.



WARNING!!

Operating the appliance without a water regulator installed will invalidate your warranty.

This product must be installed by a licensed Plumber or Gas Fitter when installed within the Commonwealth of Massachusetts.

DRAIN CONNECTION

The drain should be run to an open floor drain avoiding flexible hose that could sag and allow trapped water to accumulate.

Specific water/drain connection for City of Los Angeles

1. Each drain line from the appliance shall be routed without dips or sags to terminate above the flood level rim of an approved indirect waste receptor.
2. The appliance shall be installed in accordance with the manufacturer's printed instructions and the LAPC and LAMC, 1999 editions.
3. A backflow protection device may be required by local codes. If so, install on the potable water system directly ahead of the appliance. The backflow protection device shall be any of the following: an approved pressure type vacuum breaker installed at least 12" above the highest point of use, a double check valve backflow preventer or a reduced pressure principal backflow preventer.



Electrical Supply

NOTE: *Electrical connections must be performed by a qualified installer only.*

Before making any electrical connections to these appliances, check that the power supply is adequate for the voltage, amperage, and phase requirements stated on the rating name plate mounted on the appliance.

The circuit breaker that is used to provide power to this appliance must have a minimum of .076" (3mm) contact spacing. The circuit breaker must meet all Local and National installation standards.

All appliances must be installed in accordance with Local or National Electrical codes.

A wiring schematic is located in the slide out panel.

NOTE: *Disconnect the power supply to the appliance before servicing.*



WARNING!!

Improper installation may invalidate your warranty.

A strain relief for the power supply cord is provided.



WARNING!!

If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.

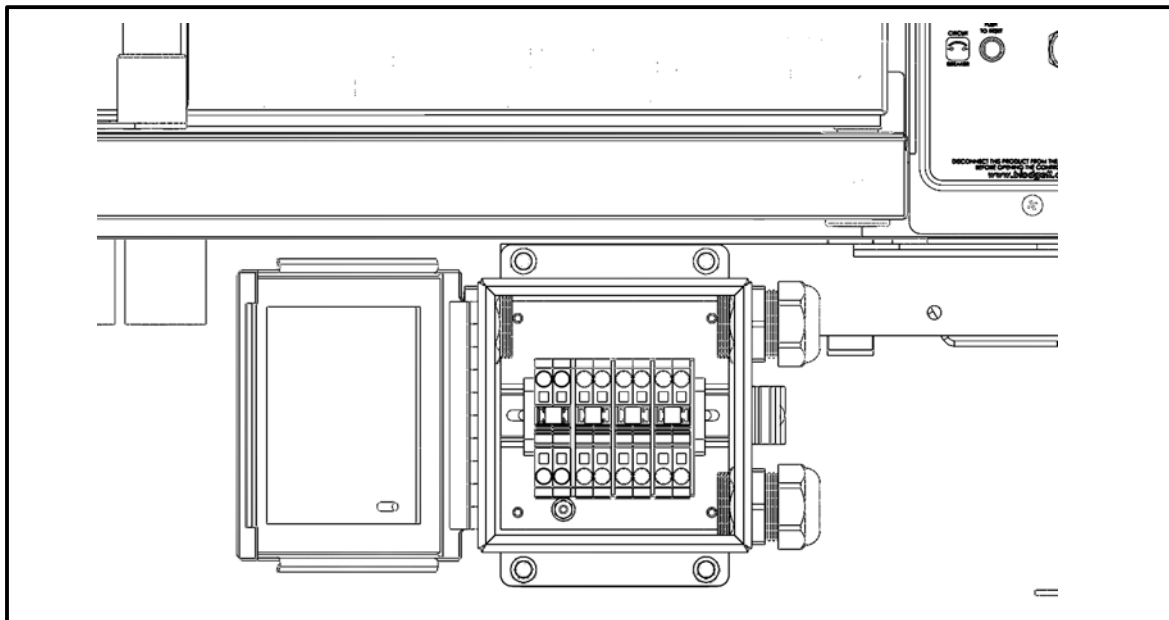


Figure 11



Operation

MenuSelect™ Control

Figure 12

CONTROL DESCRIPTION

1. START/STOP KEY - press to start, cancel or pause the bake
2. COOL DOWN KEY - initiates oven cool down cycle
3. BAKE MORE KEY - press at the end of a bake cycle to add additional bake time in one minute increments.
4. DISPLAY - displays time or temperature and other information related to oven function and/or programming.
5. NAVIGATION PAD - used to enter set points, time, and programmable settings. Also used to select the programmed product.
6. TEMP KEY - used to set or change the bake temperature
7. TIME KEY - used to set or change the bake time.
8. COMBI KEY - press to enter combi mode
9. STEAM KEY - press to enter steam mode
10. HOT AIR KEY - press to enter hot air mode
11. RETHERM KEY - press to enter retherm mode, this mode uses steam to reheat frozen or precooked product. Retherm has a temperature limit of 250-300°F.
12. STEAM ON DEMAND KEY - used to initiate steam injection cycle
13. PROBE KEY - press to use core probe cooking
14. FAN KEY - press to select the fan speed
15. LIGHT KEY - press to turn the lights on and off.
16. VENT KEY - press to manually open and close the oven vent
17. PROGRAM KEY - press to enter product programming and save programmed settings.
18. ESCAPE KEY - press to back up one step during programming
19. MAINTENANCE KEY - press to enter manager programming and save programmed settings
20. ALPHA/NUMERIC KEYPAD - used to program recipes.
21. POWER KEY - used to place control in and out of standby mode.
22. CORE PROBE CONNECTION - plug core temperature probe in here when using probe cooking



23. CIRCUIT BREAKER — Used to turn power to the unit on or off.
24. USB PORT — Used to download programming information from a USB drive

OVEN STARTUP

1. Be sure the circuit breaker is pushed in. The display flashes *OFF PRESS POWER KEY TO START*.

NOTE: If the real time clock and auto wake up functions are enabled the display reads PRESS POWER KEY TO START AUTO START.

2. Press the POWER KEY (21). The display reads *PREHEAT* and the oven heats to the last manual set temperature in the hot air mode. The display flashes *READY / IDLE* and the alarm beeps 5 times when the oven is at temperature and ready to bake.

MANUAL COOKING

1. Press the arrows on the NAVIGATION PAD (5) until the display reads *MANUAL*.
2. Press the TIME KEY (7). Use the either the arrows or the alpha/numeric keypad to enter the desired bake time. Press OK on the NAVIGATION PAD (5) to set the bake time.

NOTE: Time is set in one minute increments using the arrows. To set time in less than one minute increments use the alpha/numeric keypad.

3. Press the TEMP KEY (6). Use the arrows or the alpha/numeric keypad to enter the desired bake temperature. Press OK to set the bake temperature. The oven preheats to the new temperature.

NOTE: Temperature is set in 5 degree increments using the dial. To set time in less than 5 degree increments use the alpha/numeric keypad.

4. Press the desired mode key, combi, steam, hot air or retherm.

If Combi or Retherm are selected, use the arrows or the alpha/numeric keypad to enter the desired percentage of steam.

NOTE: Retherm has a temperature limit of 250-300 °F.

5. When the display flashes *READY / IDLE*, open the doors. Load the product.
6. Press the START/STOP KEY (1) to begin the bake cycle. The timer counts down and the display alternates between the cooking mode and the name of the product.

PROGRAMMED COOKING

1. Press the down arrow key until the name of the product is highlighted, or use the alpha/numeric keypad to enter a recipe number. Press OK to select. The oven preheats to the programmed temperature in the correct cooking mode. The display flashes *READY / IDLE* and the alarm beeps 5 times when the oven is at temperature and ready to bake.
2. Open the doors. Load the product.
3. Press the START/STOP KEY (1) to begin the bake cycle. The timer counts down and the display alternates between the cooking mode and the name of the product.

PROBE COOKING

1. Press the PROBE key (13) to select the probe mode. The display reads *CORE PROBE COOK & HOLD*. Use the arrows to select either YES or NO. Press OK to select.

If YES is selected, Cook & Hold has been enabled. In the Cook & Hold mode, the oven cavity lowers to the product pull temperature as the product cooks.

If NO is selected, Cook & Hold has not been enabled the cavity maintains the cook temperature.

2. Use the arrows to enter the desired product pull temperature in the display. Press OK to save the pull temperature.
3. Press the TEMP KEY (6). Use the arrows or the alpha/numeric keypad to enter the desired bake temperature. Press OK to set the bake temperature. The oven preheats to the new temperature.

NOTE: Temperature is set in 5 degree increments using the dial. To set time in less than 5 degree increments use the alpha/numeric keypad.



Operation

MenuSelect™ Control

4. Press the desired mode key, combi, steam, hot air or retherm.

If Combi or Retherm are selected, use the arrows or the alpha/numeric keypad to enter the desired percentage of steam.

NOTE: Retherm has a temperature limit of 250-300 °F.

5. Insert the core probe into the product. Load product into the oven and close the door. Be sure that the terminal end of the core probe is outside of the oven and clear of the door.

6. Connect the core probe to the PROBE CONNECTION (22) at the bottom of the control.

NOTE: Do not connect the probe before the cook mode has been selected.

7. The display gives the actual core probe temperature as well as the oven set temperature.
8. When the product reaches the pull temperature the buzzer sounds.
9. Press the START/STOP KEY (1) to silence the buzzer.

If using Cook & Hold – The cavity temperature continues to drop to the product pull temperature and the display counts up, telling the operator how long the product has been held. Disconnect the core probe and remove the product when ready.

If not using Cook & Hold – The cavity remains at the cook temperature. The display does not count up. Disconnect the core probe and remove the product when the buzzer sounds.

DURING ANY COOK CYCLE

Steam On Demand

While in the Hot Air, Combi or retherm modes, the unit can be set to steam for a timed period of up to 20 minutes. At the end of the timed cycle the unit reverts back to the original setting. Steam On Demand can be used at any time during the cook cycle.

1. Press the STEAM ON DEMAND KEY (12).
2. Use the arrows or the alpha/numeric keypad to enter the desired steam on demand time. Press OK to initiate Steam on Demand cycle.

NOTE: Steam on Demand time is set in one minute increments using the arrows. To set time in less than one minute increments use the alpha/numeric keypad.

3. The Steam on Demand LED flashes until the steam time has expired.

Venting Moisture from the Oven Cavity

1. Press the VENT KEY (16). This manually opens the vent until the key is pressed again to close it.

Pause a Bake Cycle

1. To pause a cook cycle, press the START/STOP KEY (1). The LED on the start/stop key flashes. The bake cycle will pause until the key is pressed again.

Cancel a Cook Cycle

1. To cancel the cook cycle, press and hold the START/STOP KEY (1).

AT THE END OF ANY COOK CYCLE

1. An alarm sounds, the display reads *DONE*.
2. If more bake time is desired, press the BAKE MORE KEY (3). This will add an additional one minute of time for each press of the key.
3. When you are satisfied with the bake, press the START/STOP KEY (1) to silence the alarm. Open the door to remove the product.

OVEN SHUTDOWN

1. Press the COOL DOWN KEY (2). The display reads *AUTO COOL DOWN ACTUAL TEMP*. To speed up the cool down process, open the doors and press the VENT KEY (16) to open the vent.
2. When the oven has cooled down, the display reads *OFF PRESS POWER KEY TO START*.

NOTE: The lights shut off and the vent closes automatically at the end of the cool down cycle.



PRODUCT PROGRAMMING

Entering the Program Mode

1. Press the PROGRAM KEY (17). If the control is password protected, the display reads *ENTER CODE*. Use the alpha/numeric keypad to enter the manager passcode. Press the OK to enter the program mode.

Naming a Product Recipe

NOTE: Use the following procedure to name a new product or edit the name of an existing product.

1. **For a new recipe**, press the down arrow key to the first open product. Press OK to select.
To edit an existing name, press the down arrow key to display the name to be changed. Press OK to select.
2. Use the arrows to scroll down to Edit Name. Press OK to enter the edit name menu.
3. Use the arrows or the alpha/numeric keypad to select the first character. Press OK to advance to the next character. Repeat for all remaining characters.
NOTE: Product names may be up to 10 characters long and can contain spaces. Use the #1 key to insert spaces in a recipe name.
NOTE: To select letters using the keypad, press the appropriate key once if you need the first letter on the key, twice for the second and three times for the third. For example to enter the letter L press the #5 key three times.
4. Press the PROG KEY (17). With **SAVE** highlighted, press OK to save the product name.

Programming a Product Recipe

NOTE: The control can hold 99 recipes. Each recipe may have up to 6 cooking stages.

1. Use the arrows to highlight the name of the product to be programmed. Press OK to select the product.
2. The display reads *PRODUCT NAME: STAGE 1*. Press OK to select the stage.
3. Use the arrows or the alpha/numeric keypad to enter the desired bake time. Press OK to set the bake time.

NOTE: Time is set in one minute increments using the arrows. To set time in less than one minute increments use the alpha/numeric keypad.

4. Use the arrows to select the desired cooking mode. Choose from combi, steam, hot air or retherm. Press OK to set the cook mode.
If Combi or Retherm are selected, use the arrows or the alpha/numeric keypad to enter the desired percentage of steam.
5. Use the arrows or the alpha/numeric keypad to enter the desired cook temperature. Press OK to set the bake temperature.

NOTE: Temperature is set in 5 degree increments using the arrows. To set time in less than 5 degree increments use the alpha/numeric keypad.

NOTE: Retherm has a temperature limit of 250-300 °F.

6. Use the arrows to select the desired fan speed. Choose from gentle, low, high or turbo. Press OK to set the fan speed.



Operation

MenuSelect™ Control

7. Use the arrows to select the fan rotation cycle. Choose between manual or auto.

NOTE: This is the length of time the fan will rotate in one direction before reversing.

If manual is selected, use the arrows or the alpha/numeric keypad to enter the desired fan cycle. Press OK to set the fan cycle.

If auto is selected, the program will use the default fan cycle setting. The default is set through the Manager Programming. See page 17.

8. Use the arrows to set the vent position. Choose between OPEN or CLOSE. Press OK to set the vent position.
9. Use the arrows to scroll down to *PRODUCT NAME: STAGE 2*. Press OK to select stage 2.
10. Repeat steps 2-9 for all remaining stages.
11. When all stages have been programmed, press the PROGRAM KEY (17). To save the programming, use the arrows to scroll to YES. Press OK. The control exits the program mode.

USING THE USB PORT

1. With the power on, remove the cover of the USB port (24) and insert the USB drive.
2. Press the MAINTENANCE KEY (19).
3. Turn the dial to highlight *MANAGER PROGRAM*. Press the center of the dial to select.
4. Turn the dial to highlight either *COPY RECIPE FROM USB* or *COPY RECIPE TO USB*, then press the center of the dial to select.
5. When the transfer is complete, press any key to return to the menu.
6. Turn the dial to highlight *EXIT*. Press the center of the dial to select. The display returns to the previous menu.
7. Turn the dial to highlight *EXIT*. Press the center of the dial to select.



MANAGER PROGRAMMING

Entering the Manager Program Mode

1. Press the MAINTENANCE KEY (19). If the control is password protected, the display reads *ENTER CODE*. Use the alpha/numeric keypad to enter the manager passcode. Press OK to enter the program mode.
1. Use the arrows to highlight *OVEN SETUP*. Press OK to select the product.

Programming Auto Start

NOTE: The Auto Start function enables the oven to turn on at a programmed time of day and preheat to a programmed temperature.

1. Use the arrows to highlight *AUTO START*. Press OK to select.
2. Use the arrows to select either ON or OFF. Press OK to select.
If ON is selected, the display reads *AUTO START 24 HOUR TIME 00:00*. Use the arrows to enter the time you would like the oven to begin preheating. Press OK to select.
The display reads *AUTO START TEMP XXX*. Use the arrows to enter the desired preheat temperature. Press OK to select.

Programming Oven Setup

These menus allow the manager to set up basic oven functions

1. Use the arrows to highlight *OVEN SETUP*. Press OK to select.
2. Use the arrows to highlight *MANAGER PROGRAM*. Press OK to select.
3. Use the arrows to highlight the oven function you wish to change. Press OK to select. Choose from the following functions:

Recipe Password — Select YES or NO to enable password protection on recipe programming. If YES is selected the passcode 3124 must be entered to change recipe programming.

Temp Unit — Select either degrees F or C.

Cool Down Temp — Select the set temperature for the oven to achieve in Cool Down mode

Temp Disp Rate — Set the rate, in seconds, at which the display switches between actual and setpoint temperature

Input Rsp Time — Set the length of time allowed to input each variable when programming recipes before control automatically exits out

Setback Time — When not used for a period of time, the oven temperature will automatically reduce to conserve energy. This variable sets the length of time the oven remains at the idle temperature before being lowered.

Ready Beep — Select either ON or OFF. This is the audible alarm that sounds when the oven has reached the set temperature.

Cook Cool Fan — Select either YES or NO. This function allows the control to display *OPEN OVEN DOOR* when you are attempting to lower the set temperature of the oven.

Restore Manual — Select either YES or NO. This variable enables the oven to remember the last settings used for manual cooking.

4. After editing a function, press OK to save.
5. When all desired functions have been edited, use the arrows to highlight *EXIT*. Press OK to exit the manager programming mode.



Maintenance

Spray Bottle Operating Procedure

NOTE: Only use a commercial oven cleaner/degreaser with the spray bottle. DO NOT use chemicals that are not intended as oven cleaners. See chemical manufacturer's information for intended use.

1. Unscrew the sprayer head and fill the container to the MAX mark. Screw the head assembly on firmly to ensure an airtight seal. The liquid must be clean and free from foreign matter. Do not overfill - space must be left for compressing air.
2. To build up pressure, pump approximately 20 full strokes when the container is filled with liquid. The higher the pressure, the finer the spray. If the container is only partially filled, then more pumping is required to compress the additional air space.
3. To spray, depress the trigger with your thumb.
4. Adjust spray nozzle for a wide spray pattern.
5. After a period of spraying, the pressure will drop. Restore the pressure by operating the air pump.
6. Release pressure after use by inverting the spray head and depressing the trigger or by slowly unscrewing the spray head assembly which will allow air to escape from around the filling aperture.
7. After use, rinse the spray bottle with clean water and check that the hole in the nozzle is perfectly clean and clear. Warm water (not hot) used with a household detergent is a useful cleaning agent for this purpose.

NOTE: Further information can be found in the instruction leaflet supplied with your spray bottle.



WARNING!!

Protective clothing and eyewear should be worn while using cleaning agents.

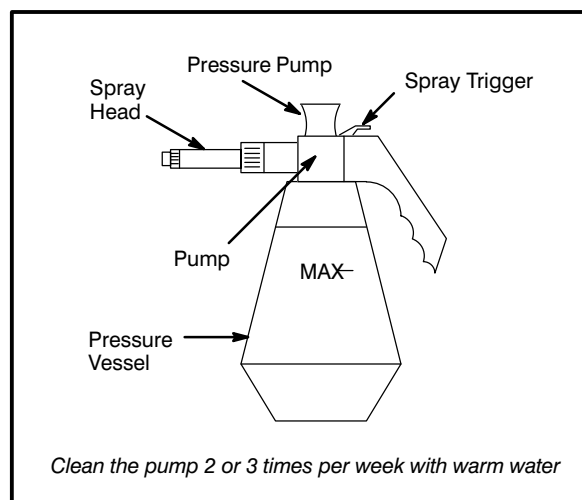


Figure 13

Complete Spray Bottle – P/N R0006

Spray Head Repair Kit – P/N R6332



Cleaning and Preventive Maintenance

CLEANING THE INTERIOR

Daily Cleaning

Daily cleaning of the appliance is essential for sanitation, and to ensure against operational difficulties. The stainless steel cavity may corrode with improper cleaning of the oven. Use an oven cleaning detergent in conjunction with the supplied spray bottle.

For difficult cleaning, allow the spray-on oven cleaner to work longer before rinsing.

1. **Cool the appliance down** to 140°F (60°C) or, if the oven has been idle, turn to the Steam mode for 3 to 4 minutes in order to warm the cavity surfaces.
2. Fill the spray bottle and pump air into the container with the pressure pump.
3. Spray the interior of the oven with a cleaning solution. Be certain to spray cleaner through the fan guard to cover all surfaces.

NOTE: Never spray water into the appliance when the temperature is above 212°F (100°C).

4. Let the cleaner work the time recommended by the cleaning solution manufacturer. For difficult, baked on grease, etc. allow to work over night.
5. Set the timer for 15 to 20 minutes.
6. Run the oven at 225°F (107°C) in the Steam mode. This will soften all burned on residue.

7. Rinse the appliance interior with water (a hose is supplied, but take care that only the interior cavity is sprayed with water). Wipe the interior dry after rinsing.
8. The doors should be kept slightly open after cleaning. This will allow the oven to vent and increase the life of the door gasket.

On stainless interiors, deposits of baked on splatter, oil, grease or light discoloration may be removed with a good non toxic industrial stainless steel cleaner. Apply cleaners when the oven is cold and always rub with the grain of the metal. The racks, rack supports and the blower wheel may be cleaned in the oven or by removing them from the oven and soaking them.

NOTE: DO NOT use corrosive cleaners not intended for oven cleaning on your oven.

Recommended cleaners:

- | | |
|--------------------|----------------------|
| a.) ECOLAB | Greasecutter Plus |
| b.) CELLO | EZ Clean |
| c.) Diversey-Lever | Advance Oven Cleaner |



WARNING!!

Be sure to read and follow the MSDS or safety instructions on the bottle for your oven cleaner.



Maintenance

Cleaning and Preventive Maintenance

Oven Weekly Cleaning

In addition to the daily cleaning, it is necessary to clean behind the fan guard of this oven on a weekly basis. This is necessary for proper functioning of the oven. Scale will build up on the fan and heat source leading to a less efficient oven.

1. Turn off the oven. Make sure that the oven is cooled down to under 140°F (60°C).
2. Remove the rack guides.
3. Rotate the two screws on the left side of the fan guard.



Figure 14

4. Remove the fan guard.



Figure 15

5. Thoroughly spray cleaner onto the fan and heat source. Close the doors to allow the cleaner to work.
6. After ten minutes, rinse the cleaner off. Return the fan guard to the closed position. Rotate the two screws to secure the fan guard.

Remove and clean the blower wheel every 6 months.

CLEANING THE EXTERIOR

The exterior of the appliance may be cleaned and kept in good condition with a light oil. Saturate a cloth and wipe the appliance when it is cold; wipe dry with a clean cloth.



WARNING!!

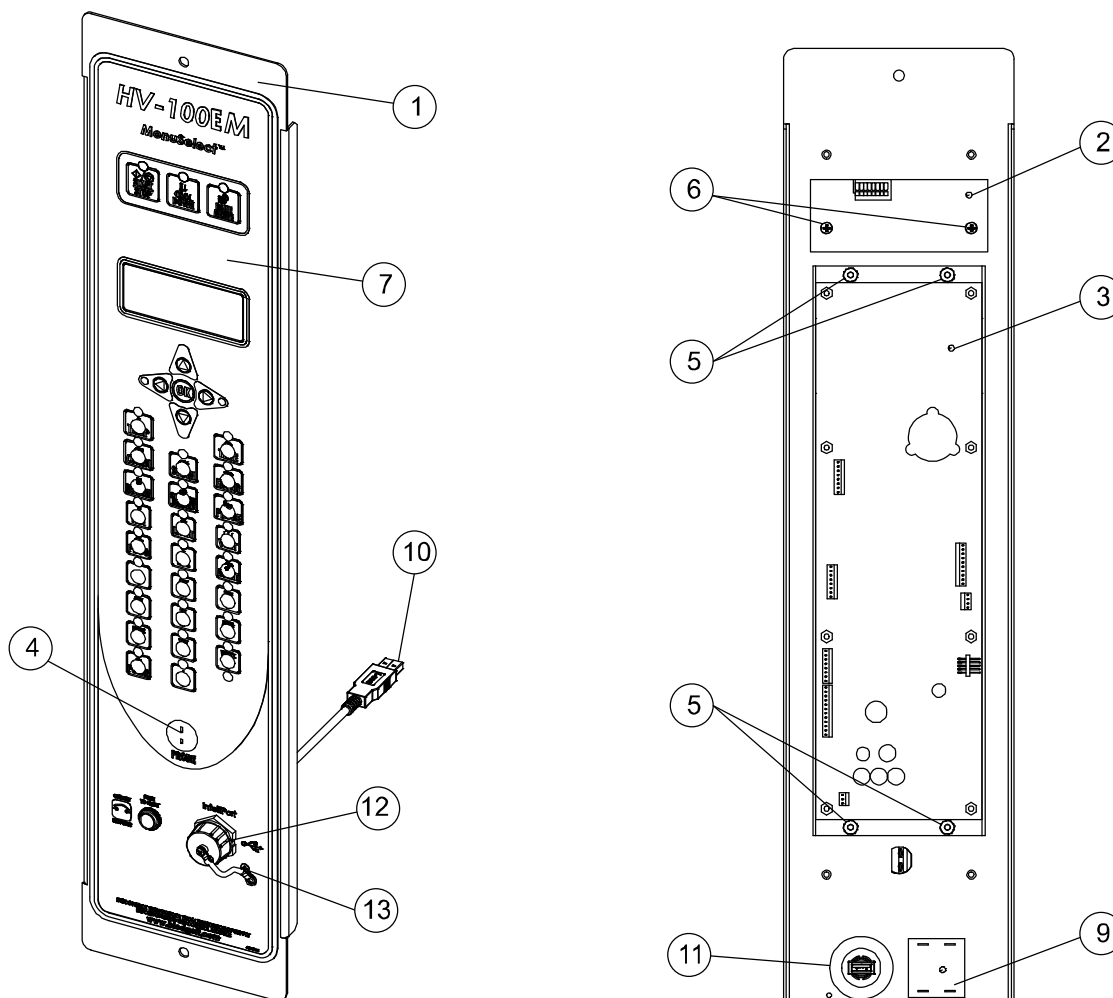
DO NOT spray the outside of the appliance with water or clean with a water jet. Cleaning with a water jet can impregnate chlorides into the stainless steel, causing the onset of corrosion.

PREVENTIVE MAINTENANCE

The best preventive maintenance measures are the proper initial installation of the equipment and a program for cleaning the appliance routinely. The oven requires no lubrication. Contact the factory, the factory representative or a local Blodgett service company to perform maintenance and repairs should they be required.



MENUSELECT CONTROL



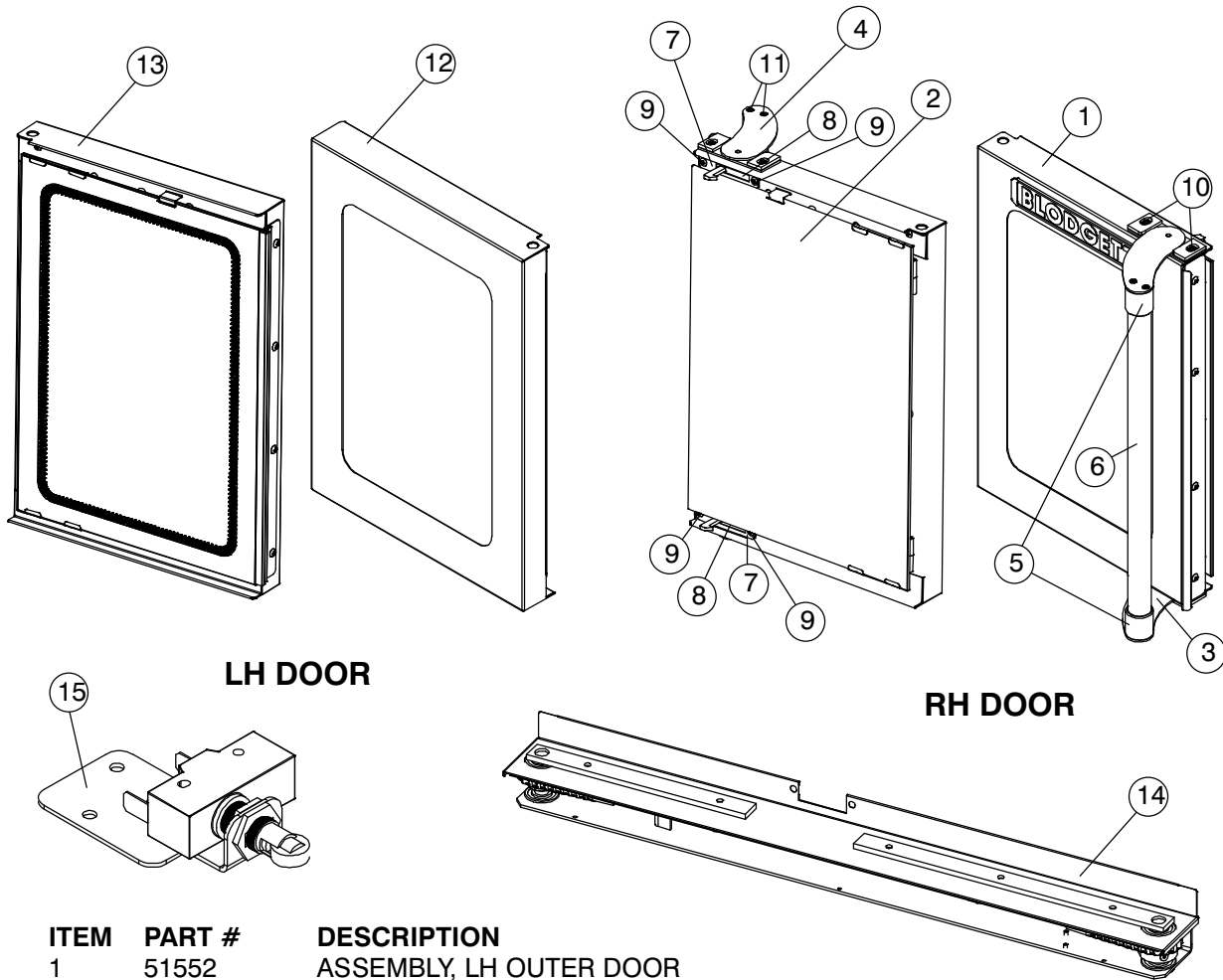
ITEM	PART #	DESCRIPTION
1	52537	CONTROL PANEL, FRONT
2	39122	BOARD, 3 BUTTON PCB
3	53487	CONTROL, NAVIGATIONAL PAD (NAVY)
4	39781	MEAT PROBE JACK
5	M3367	NUT, 6-32 KEPS (QTY 4)
6	5805	SCREW, M, 6-32 X 3/8 PNHD PH (QTY 2)
7	52574	DECAL, MARINE, NAVIGATIONAL PAD
8	51594	HARNESS, HV100E FRONT CONTROL
9	52185	CIRCUIT BREAKER, PANEL MOUNT
10	52647	USB CABLE
11	52600	SPACER, USB
12	52161	COVER, USB
13	38840	SCREW, MACH, 4-40 X 3/8, SS PAN HD



Maintenance

Replacement Parts

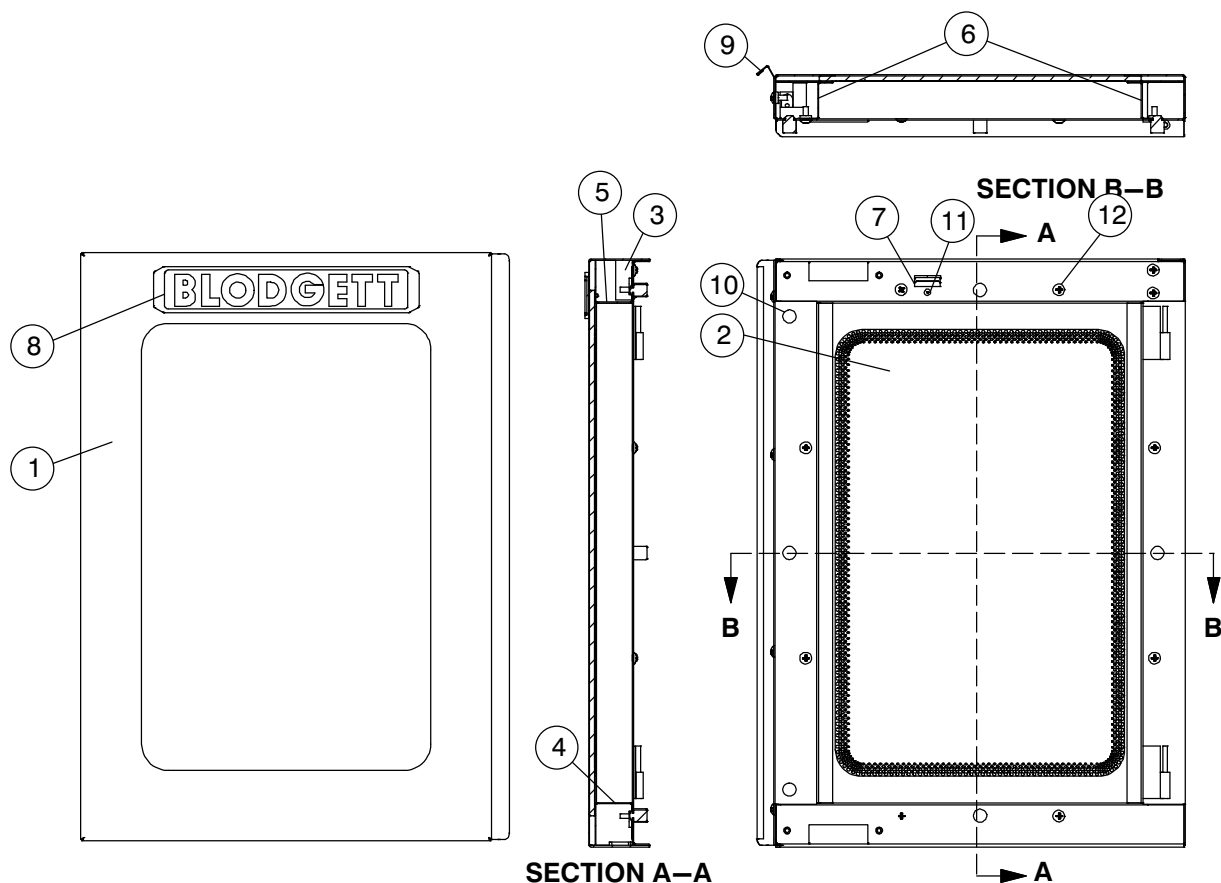
DOORS



ITEM	PART #	DESCRIPTION
1	51552	ASSEMBLY, LH OUTER DOOR
2	51534	ASSEMBLY, INNER DOOR GLASS
3	50227	ASSY, LATCH RH
4	50228	ASSY, LATCH LH
5	50213	END CAP, HANDLE (QTY 2)
6	51542	ASSEMBLY, DOOR HANDLE
7	51539	PLATE, LATCH COVER (QTY 2)
8	51668	GASKET, DOOR LATCH (QTY 2)
9	16384	10-24 X .500 TRUSS HEAD MACH SCREW (QTY 4)
10	M6315	10-24 X 1/2 HEX WASHER HEAD SCREW, S/S (QTY 4)
11	50836	SCREW, #10-24 X 2.00 FLATHEAD (QTY 4)
12	51559	ASSEMBLY, RH OUTER DOOR
13	51556	ASSEMBLY, RH INNER DOOR GLASS
14	51603	DOOR TURNBUCKLE ASSEMBLY
15	52514	DOOR SWITCH ASSEMBLY



LH OUTERDOOR SUBASSEMBLY (P/N 51552) BREAKDOWN



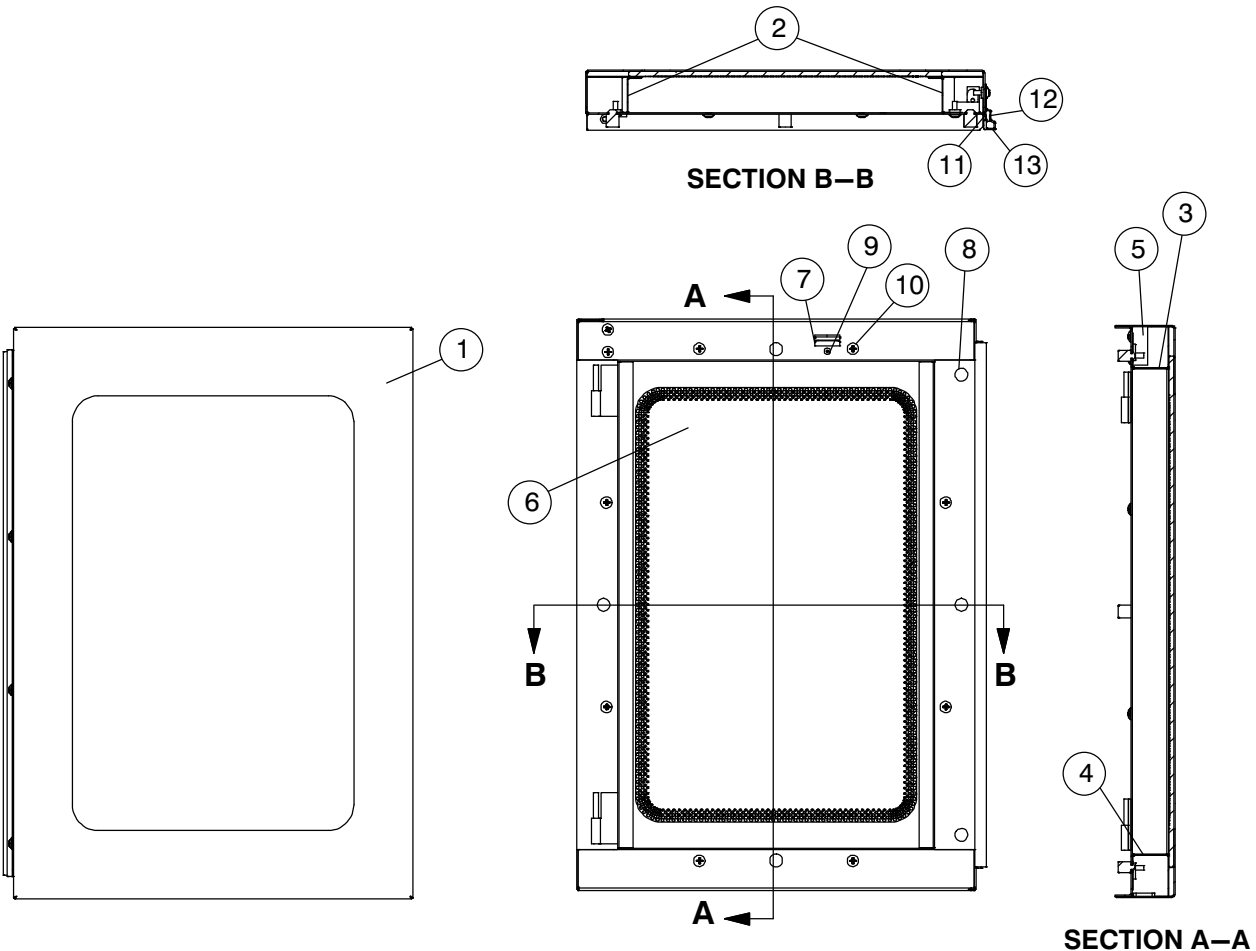
ITEM	PART #	DESCRIPTION
1	51523	DOORFRONT, LH
2	51161	GLASS, OUTER DOOR
3	51424	BUSHING, DOOR PIN
4	51664	TRIM, TOP DOOR
5	51528	TRIM, BOTTOM DOOR
6	51529	TRIM, VERTICAL DOOR (QTY 2)
7	51519	CLIP, DOOR GLASS
8	16470	NAMEPLATE, BLODGETT, 10 INCH
9	51450	DOOR CHANNEL, RH DOOR
10	51631	BUMPER, HIGH TEMPERATURE (QTY 6)
11	R1278	RIVET, 1/8" POP S/S
12	16384	10-24 X .500 TRUSS HEAD MACH SCREW (QTY 14)



Maintenance

Replacement Parts

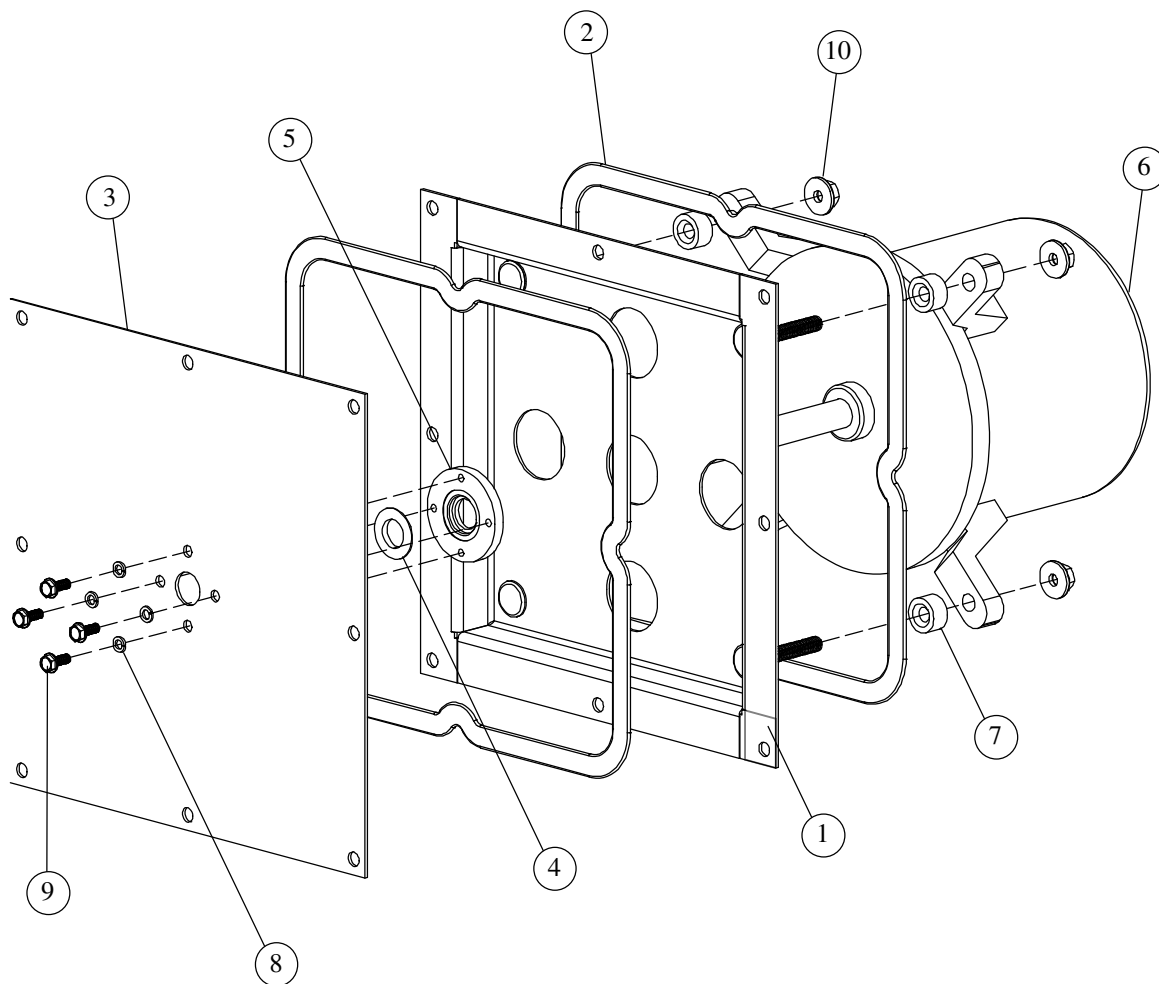
RH OUTERDOOR SUBASSEMBLY (P/N 51559) BREAKDOWN



ITEM	PART #	DESCRIPTION
1	51558	DOORFRONT, RH
2	51529	TRIM, VERTICAL DOOR (QTY 2)
3	51664	TRIM, TOP DOOR
4	51528	TRIM, BOTTOM DOOR
5	51424	BUSHING, DOOR PIN
6	51161	GLASS, OUTER DOOR
7	51519	CLIP, DOOR GLASS
8	51631	BUMPER, HIGH TEMPERATURE (QTY 6)
9	R1278	RIVET, 1/8" POP S/S
10	16384	10-24 X .500 TRUSS HEAD MACH SCREW (QTY 14)
11	51541	CENTER GASKET CHANNEL, INNER
12	52475	GASKET RETAINER, OUTER
13	51610	GASKET, CENTER DOOR



MOTOR



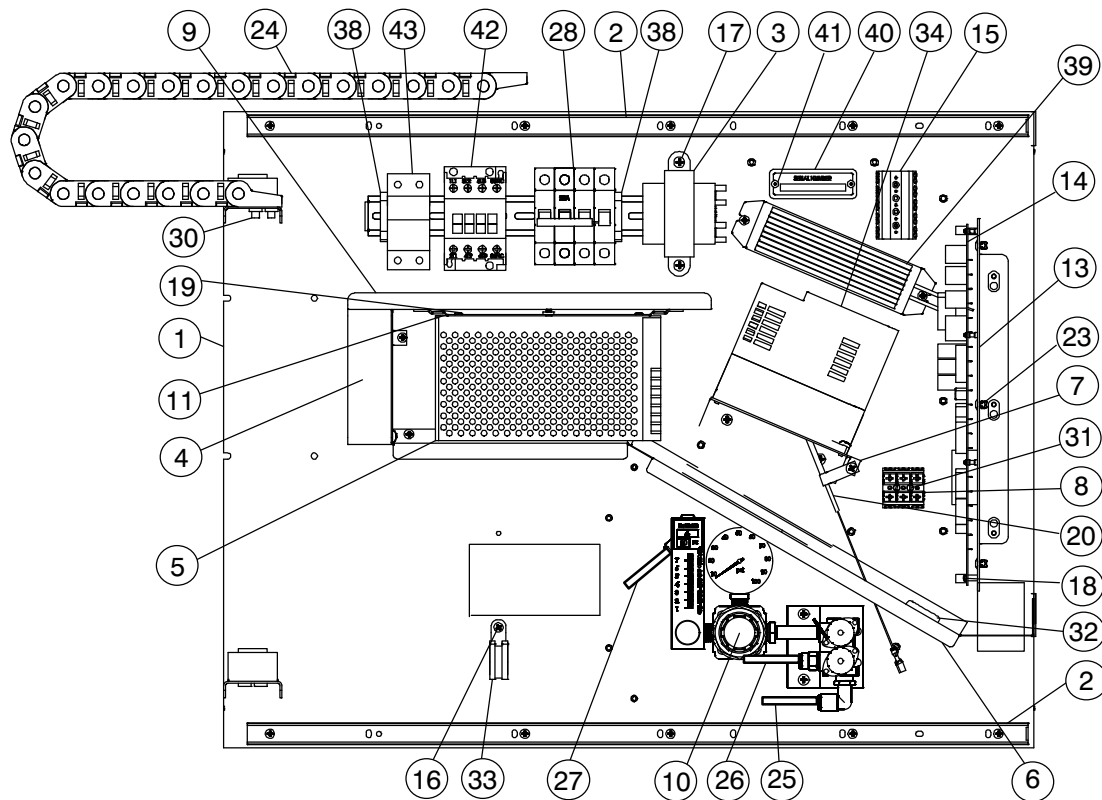
ITEM	PART #	DESCRIPTION
1	39448	MOTOR MOUNT ASSEMBLY
2	R8423	GORETEX GASKET, .25 X .18 (QTY 2)
3	R8205	PLATE, FAN BRACKET COVER
4	R4244	SHAFT SEAL
5	R8955	SEAL RETAINER
6	39332	MOTOR, 220V, 1/2 HP
7	R1971	SPACER, RACK GUIDE (QTY 4)
8	R0726	WASHER, LOCK # 10 (QTY 4)
9	R1539	10-32 X .50 HXWHD MACHINE SCREW (QTY 4)
10	8628	NUT, 5/16'-18 SERRATED FLANGE (QTY 4)



Maintenance

Replacement Parts

ELECTRICAL PANEL

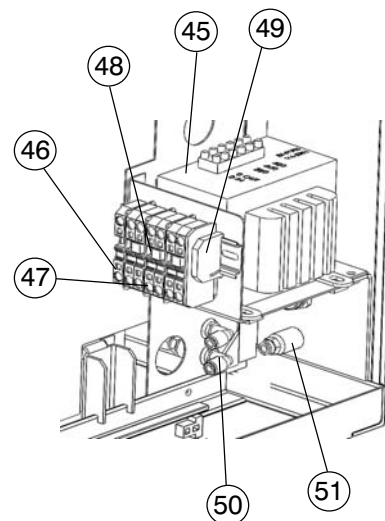


ITEM	PART #	DESCRIPTION
1	51110	BRACKET, ELECTRICAL MOUNTING
2	51588-2	DRAWER SLIDE, MOVING (QTY 2)
3	24356	TRANSFORMER, 120V TO 24V 80VA
4	M9616	AXIAL FAN, 4" (24V)
5	M9608	24VDC POWER SUPPLY
6	51436	DUCT, LOWER AIR
7	51437	BRACKET, INVERTER DRIVE
8	38605	TERMINAL BLOCK 3 POLE
9	51122	BRACKET, COOLING DIVIDER
10	52535	ASSY, WATER MANIFOLD (NAVY)
11	51435	BRACKET, POWER SUPPLY SLIDE
12	15847	GROMMET, RUBBER 11/16
13	51489	BRACKET, I/O BOARD
14	51948	INTERFACE BOARD



ELECTRICAL PANEL (Continued)

ITEM	PART #	DESCRIPTION
15	50952	TERMINAL BLOCK, 5 POSITION PUSH IN
16	51614	SCREW, #8-32 X .25 PAN PH (QTY 17)
17	4812	#10 X 3/8 PH SCREW (QTY 8)
18	34706	SCREW, MACH M3X.5X10MM SS PNHD (QTY 4)
19	16821	SCREW, #5-40 X 3/16 PH PHILLIPS MACHINE (QTY 3)
20	51516	PROBE, 3/16" DIA. 1K OHM RTD
21	51595	HARNESS, HV100E 208-240V
22	51593	HARNESS, HV100E REAR OVEN
23	51622	WIRE TIE BASE, BACK MOUNT (QTY 11)
24	52292	2" WIDE CABLE CARRIER
25	52351	BLUE POLYURETHANE TUBING (QTY 2)
26	52352	GREEN POLYURETHANE TUBING
27	52353	RED POLYURETHANE TUBING
28	52446	CIRCUIT BREAKER W/ TRIP COIL, 25A, 3 POLE
30	R5770	SCREW, 1/4-20 X .50 PANHEAD (QTY 2)
31	37951	SCREW, MACHINE, PAN HEAD #4-40 X 1.00 (QTY 2)
32	4068	GROMMET, BLACK RUBBER
33	R5056	CUSHION CLAMP
34	52680	INVERTER DRIVE, J1000, PROGRAMMED
37	39914	SCREW, #8-32X1/2 TRUSS HEAD (QTY 2)
38	R11090	ENDSTOP, DIN RAIL (QTY 2)
39	52706	RESISTOR, MOTOR BRAKING
40	15772	SERIAL TAG
41	R1278	RIVET, 1/8" POP S/S (QTY 2)
42	52717	CONTACTOR, 3PHASE 24VDC COIL
43	51454	FUSE HOLDER
44	51455	FUSE, 7A 600V (QTY 2)
45	51453	TRANSFORMER
46	52204	GROUND LUG TERMINAL
47	52201	TERMINAL BLOCK
48	R11100	SHORTING JUMPER
49	R11090	END STOP (BOTH ENDS)
50	51617	1/4" SWIVEL ELBOW
51	51616	1/4" STRAIGHT FITTING

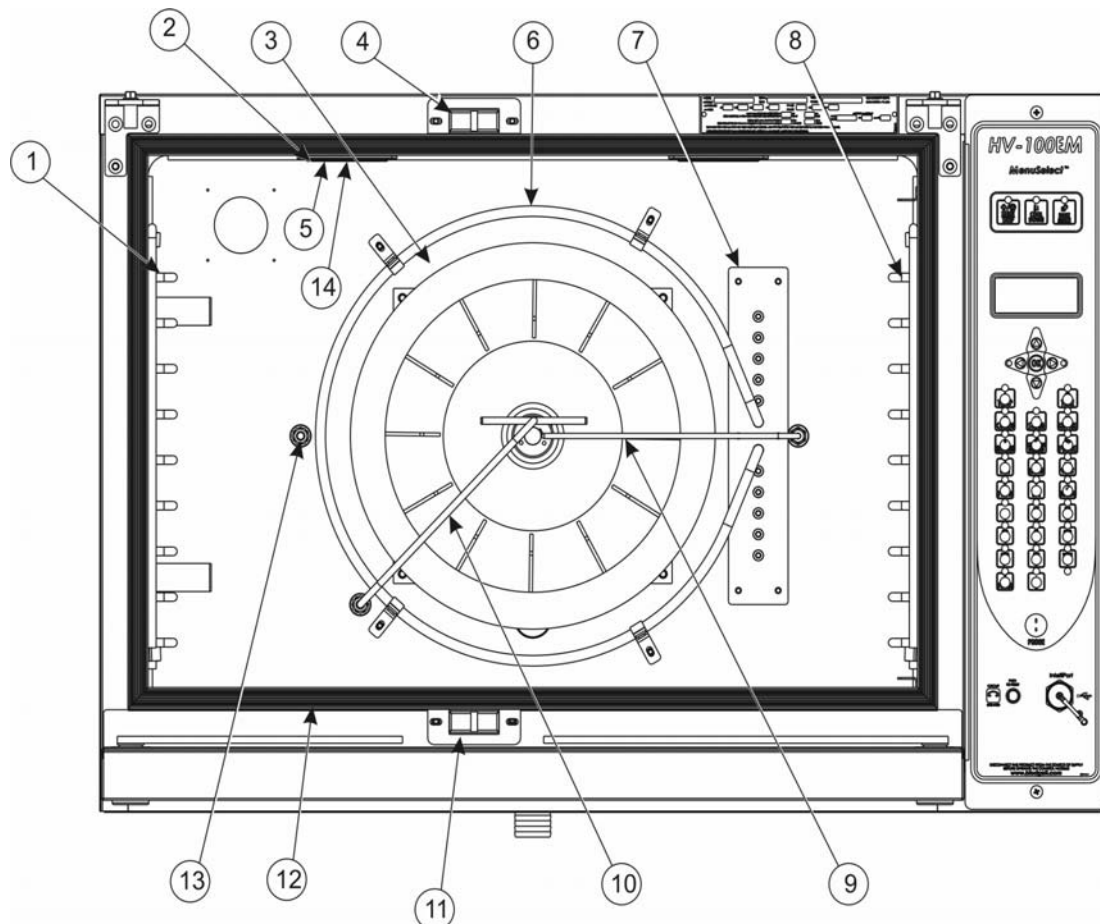




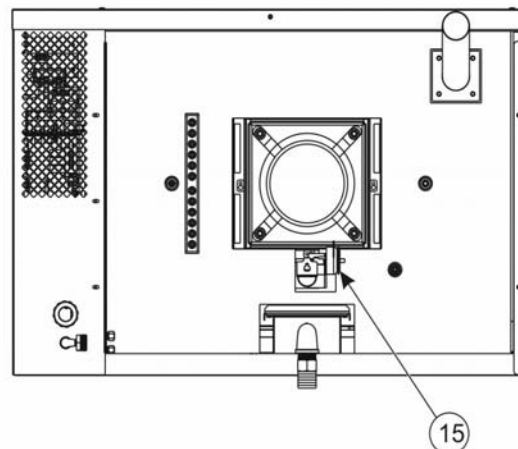
Maintenance

Replacement Parts

INTERIOR COMPONENTS



ITEM	PART #	DESCRIPTION
1	51623	RACK SUPPORT
2	D0128	LIGHT BULB
3	39785	BLOWER WHEEL
4	51488	DOOR CATCH
5	50192	LIGHT GLASS
6	53016	220V ELEMENT (440V OVEN)
7	52304	ELEMENT GASKET
8	51623	RACK SUPPORT
9	52307	CAVITY PROBE
10	50020	SPRAY TUBE
11	51488	DOOR CATCH
12	52716	PERIMETER DOOR GASKET
13	36441	HI-LIMIT PROBE
14	D0127	LIGHT GASKET
15	39324	CAVITY VENT SOLENOID



Maintenance



Second Level Programming

NOTE: The oven must be in the ON position in order to run the 2nd level programming

Press Maint Key	Scroll with ▲ or ▼ keys to "Factory Program"
Press Ok	Enter Code "3228"
Press Ok	Scroll to "Appliance Type"
Press Ok	Use ◀ or ▶ to set to "Electric"
Press Ok	Scroll to "Boiler Enable"
Press Ok	Use ◀ or ▶ to set to "No"
Press Ok	Scroll to "Quench Enable"
Press Ok	Use ◀ or ▶ to set to "No"
Press Ok	Scroll to "Exit"
Press Ok	Scroll to "Service"
Press Ok	Enter Service Code "7378"
Press Ok	Scroll to "Diagnostic Output"
Press Ok	
Press and hold each button below to test the function listed on the right:	(Component Tested) See "Trouble Shooting Test Points" for output testing if necessary
Temp	Heat On (Fan High Fwd, Hot Air, Hot Air Enable, Hot Air Contactor)
Combi	Fan Speed Gentle Forward (20 Hz)
Fan	Fan Speed Low Forward (30 Hz)
Prog	Fan Speed High Forward (40 Hz)
1	Fan Speed Turbo Forward (50 Hz)
4	Fan Speed High Reverse (-40 Hz)
7	Light
Light	Spritzer
Esc	Cooling Fan
2	Vent
5	Hot Air
8	Hot Air Enable
0	Quench
Time	Cook Done



Maintenance

Second Level Programming

Press Ok to Exit	Scroll to "Diagnostic Input"
Press Ok	
Press and hold each button below to test the input listed on the right:	(Input Tested)
Temp	Fan Error (Open or Closed Drive At Speed Relay)
Combi	Door (Open or Closed Door Switch)
Fan	Cavity Probe Temp
Prog	Cooling Fan Probe Temp
4	Core Probe Temp (Open if not inserted)
Press Ok to Exit	Press Esc to Exit
Press Esc to Exit	



TEST POINTS USING CONTROL DIAGNOSTIC OUTPUTS

Key	Output Components	Test Points to Relay Board		Voltage AC + DC
		Black Lead	Red Lead	
Temp	Heat On (Fan High Fwd, Hot Air, Hot Air Enable, Hot Air Contactor) Hot Air	Terminal Block 4 Pin #4k 4-Pin #4	Connector J6-Pin #4-RD Wire	24VDC
Temp	Heat On (Fan High Fwd, Hot Air, Hot Air Enable, Hot Air Contactor) Hot Air Enable	Terminal Block 4 Pin #4	Connector J6-Pin #8-BL Wire	24VDC
Temp	Heat On (Fan High Fwd, Hot Air, Hot Air Enable, Hot Air Contactor) Hot Air Contactor	Terminal Block 4 Pin #4	Connector J20-Pin #2-OR Wire	24VDC
7	Light	Terminal Block 4 Pin #4	Connector J3-Pin #4-RD Wire	24VDC
Light	Spritzer	Terminal Block 4 Pin #4	Connector J18-Pin #3-VI Wire	24VDC
Esc	Cooling Fan	Terminal Block 4 Pin #4	Connector J3-Pin #11-GY Wire	24VDC
2	Vent	Terminal Block 4 Pin #4	Connector J2-Pin #4-GY Wire	24VDC
5	Hot Air	Terminal Block 4 Pin #4	Connector J6-Pin #4-RD Wire	24VDC
8	Hot Air Enable	Terminal Block 4 Pin #4	Connector J6-Pin #8-BL Wire	24VDC
Time	Cook Done	Terminal Block 4 Pin #4	Connector J2-Pin #2-No Wire	24VDC



Maintenance

Troubleshooting

TEST POINTS USING CONTROL DIAGNOSTIC OUTPUTS

Key	Fan Control Components	Test Points to Relay Board		Voltage AC + DC
		Black Lead	Red Lead	
Combi	Fan Speed Gentle Forward (20 Hz)	J2 9-12 See Chart Below	Terminal Block 4 Pin #4	24VDC
Fan	Fan Speed Low Forward (30 Hz)	J2 9-12 See Chart Below	Terminal Block 4 Pin #4	24VDC
Prog	Fan Speed High Forward (40 Hz)	J2 9-12 See Chart Below	Terminal Block 4 Pin #4	24VDC
1	Fan Speed Turbo Forward (50 Hz)	J2 9-12 See Chart Below	Terminal Block 4 Pin #4	24VDC
4	Fan Speed High Reverse (-40 Hz)	J2 9-12 See Chart Below	Terminal Block 4 Pin #4	24VDC

Output Components	J2.9 (Bit 0)	J2.10 (Bit 1)	J2.11 (FWD)	J2.12 (REV)
Gentle Forward Outputs (20 Hz)	0v	0v	23Vdc Rtn	0v
Low Forward Outputs (30 Hz)	23Vdc Rtn	0v	23Vdc Rtn	0v
High Forward Outputs (40 Hz)	0v	23Vdc Rtn	23Vdc Rtn	0v
Turbo Forward Outputs (50 Hz)	23Vdc Rtn	23Vdc Rtn	23Vdc Rtn	0v
Gentle Reverse Outputs (-20Hz)	0v	0v	0v	23Vdc Rtn
Low Reverse Outputs (-30Hz)	23Vdc Rtn	0v	0v	23Vdc Rtn
High Reverse Outputs (-40Hz)	0v	23Vdc Rtn	0v	23Vdc Rtn
Turbo Reverse Outputs (-50Hz)	23Vdc Rtn	23Vdc Rtn	0v	23Vdc Rtn



Sequence of Operation

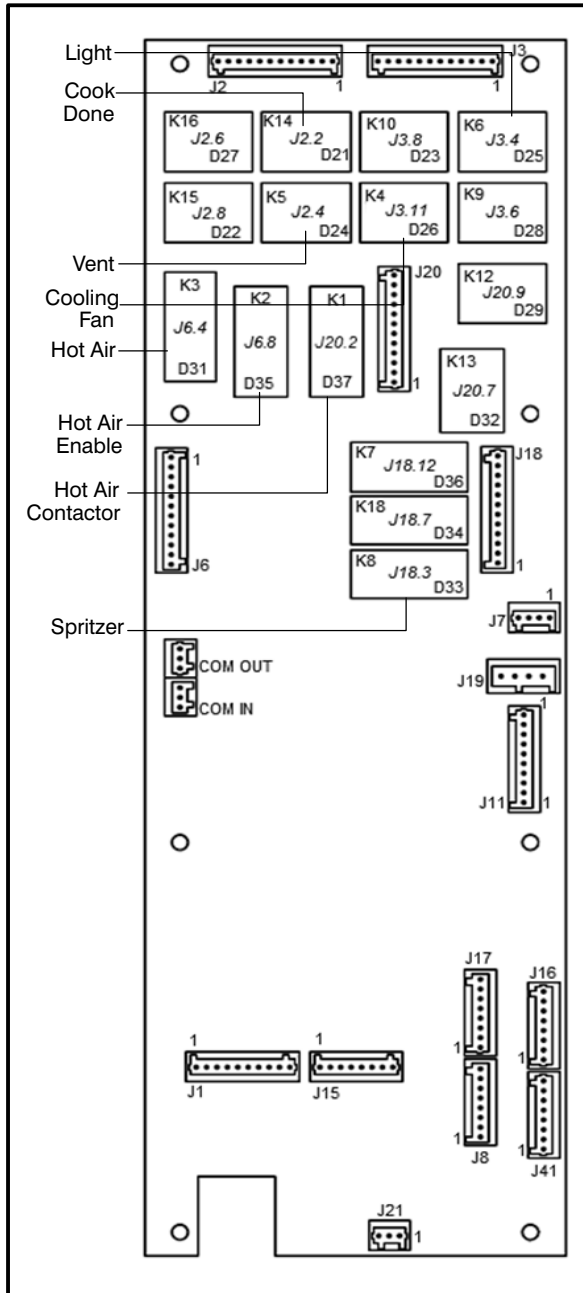


Figure 16

When the Control is first turned on, it begins to **Preheat** the oven to 350°F by enabling the following relays. The activated relays are associated with red LEDs which will turn on when the control sends a call to the relay. Relays are designated with a K, LEDs are designated with a D, and Junctions are labeled with a J. In preheat the following LEDs will be lit:

D25 LED will come on as the **Light** relay, K6, is closed. The cavity lights will remain on until the Light button is pressed to turn them off. Check for 24 VDC output at J3.4, which feeds the cavity lights on the red wire.

D31 LED will be lit as the Hot Air (Power On) relay is enabled on this unit. The Hot Air relay is active whenever the red light is on at the Power Button. Check for 24 VDC output from K3 at J6.4 on the orange wire, which jumps to the common for the K2 relay at J6.7. The K2 relay waits for input from the Fan@Speed or Drive@Set Speed Relay, which is 24 VDC return at the grey wire in J11.4.

D35 LED shows the Hot Air Enable relay is activated when the Fan@Speed Relay is closed at the Inverter sending 24 VDC return in at J11.4; this signal closes K2. Check for 24 VDC output at J6.8 on the blue wire, which jumps to J20.1. J20.1 is the common to the K1 relay.

D37 LED is lit as the Hot Air Contactor relay is enabled when there is a **Call for heat**. A call for heat is generated when the cavity probe (or core probe when not in preheat) reads resistance/temperature below the current set point, which is 350°F during preheat. Check for 24 VDC at J20.2, which is the K1 relay output that feeds the contactor coil on the orange wire.

Also in preheat, the control will call for Fan High Speed Forward by sending 23 VDC return on J2.10 and J2.11, and 0 VDC on J2.9 and J2.12. Note: outside the ready band, which is -10 to +25°F, in relationship to the set point, the control automatically switches to high fan speed and can be used only in high fan speed or turbo fan speed. Once in ready band, all speeds are available.



Maintenance

Sequence of Operation

After preheat the control can be operated in Manual Mode or in one of the **100 programs**. Each program can have up to 6 steps and a hold. In each step the user can program Core Probe (Yes/No), Cook Time, Mode (Steam/Combi/Reth/Hot A), Set Temp, Fan Speed (Gentle/Low/High/Turbo), Fan Reverse (Manual/Auto), Fan Reverse Time, and Vent Setting (Close/Open).

If Core Probe is "Yes", the unit will look for the resistance at the probe port on the front on the control. If Fan reverse is set to Auto, the control will automatically reverse the fan every 2 minutes while a time counting down. If it is set to manual, the reverse time can be set. Also the Cook Time, Cook Mode, Set Temp, Fan Speed, as well as Vent position, can be programmed for each step. When the **Vent** is opened, D24 LED lights and 24 VDC is sent by K5 on the grey wire at J2.4; no voltage is present when the vent is closed.

If operating in **Manual Mode**, you can manually modify the Fan Speed, the Vent Position, Core or Cavity Probe, Time and Temp, Steam on Demand (not functional in steam mode) and the Cook Modes: Hot Air, Combi, Steam, and Retherm.

Hot Air uses the "call for heat" sequence mentioned above.

Combi uses the same call for heat and the Water Spritzer is cycled at 33% for the default setting, or 20 seconds on 40 Seconds off. The cycle rate can be adjusted from 0 to 100%. When the **Water Spritzer** is called for, D33 is lit, and K8 sends out 24 VDC on the Violet wire at J18.3.

Steam uses the same call for heat and the Spritzer is cycled at 100%. In steam the lowest temperature setting is 85°F and the maximum temperature in the steam mode is 225°F. Steam on demand is not available in Steam mode because the control is cycling the Spritzer at 100% already.

Retherm uses the Water Spritzer at a 25% duty cycle, or 15 seconds on 45 Seconds off, and the call for heat is set at 250°F as the default temperature. The Water Spritzer cycle rate can be adjusted from 10 to 90% and the Temperature can be set to 250 – 300°F.

When the **Control calls for the fan** to go Forward, J2.11 will have 23 VDC return and J2.12 will have 0 VDC. That condition will invert when the fan call is for Reverse; J2.12 will have 23 VDC return and J2.11 will have 0 VDC. The speeds are set by J2.9 and J2.10. 0 VDC on both is Gentle Speed, J2.9 with 23 VDC return and J2.10 with 0 VDC is Low Speed, J2.9 with 0 VDC and J2.10 with 23 VDC return is High Speed, and 23 VDC return on J2.9 and J2.10 is Turbo Speed.

The **Cooling Fan** is controlled by the probe located under the Inverter heat sink; it is cycled on at 100°F. When the Cooling Fan is called for, K4 Relay sends 24 VDC out at J3.11 on a grey wire, and the call is indicated by LED D26. The Cooling Fan is also activated at any time the timer is counting down.

Cook Done is not used. Therefore no wire is located at J2.2, where K14 sends 24 VDC when D21 is lit. However, Cook Done is activated when the Timer goes off on the control.



Component Resistance Readings

Part Name	Ohms
24VDC Power Supply, Across +V & -V (Unwired DC Voltage)	326
24VDC Power Supply, Across L & N (Unwired Line Voltage)	0.6
Control Transformer (Primary)	25
Control Transformer (Secondary)	0.6
Element, (Single element)	24
Element, (At contactor)	32.5
Heating Contactor Coil	6
Water Solenoid Valve	178
Cooling Fan	3.7

Part Name	Ohms
Convection Motor Windings Blue to Black	6.2
Connection Motor Windings Brown to Black	6.2
Connection Motor Windings Brown to Blue	6.2
Circuit Breaker Trip Coil	3.7
Vent Solenoid	30
Step Down Transformer (Primary)	2
Step Down Transformer (Secondary)	1

NOTE: Readings may vary some based on meter capability and accuracy.

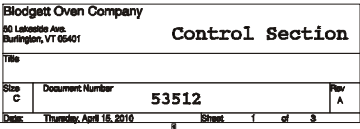


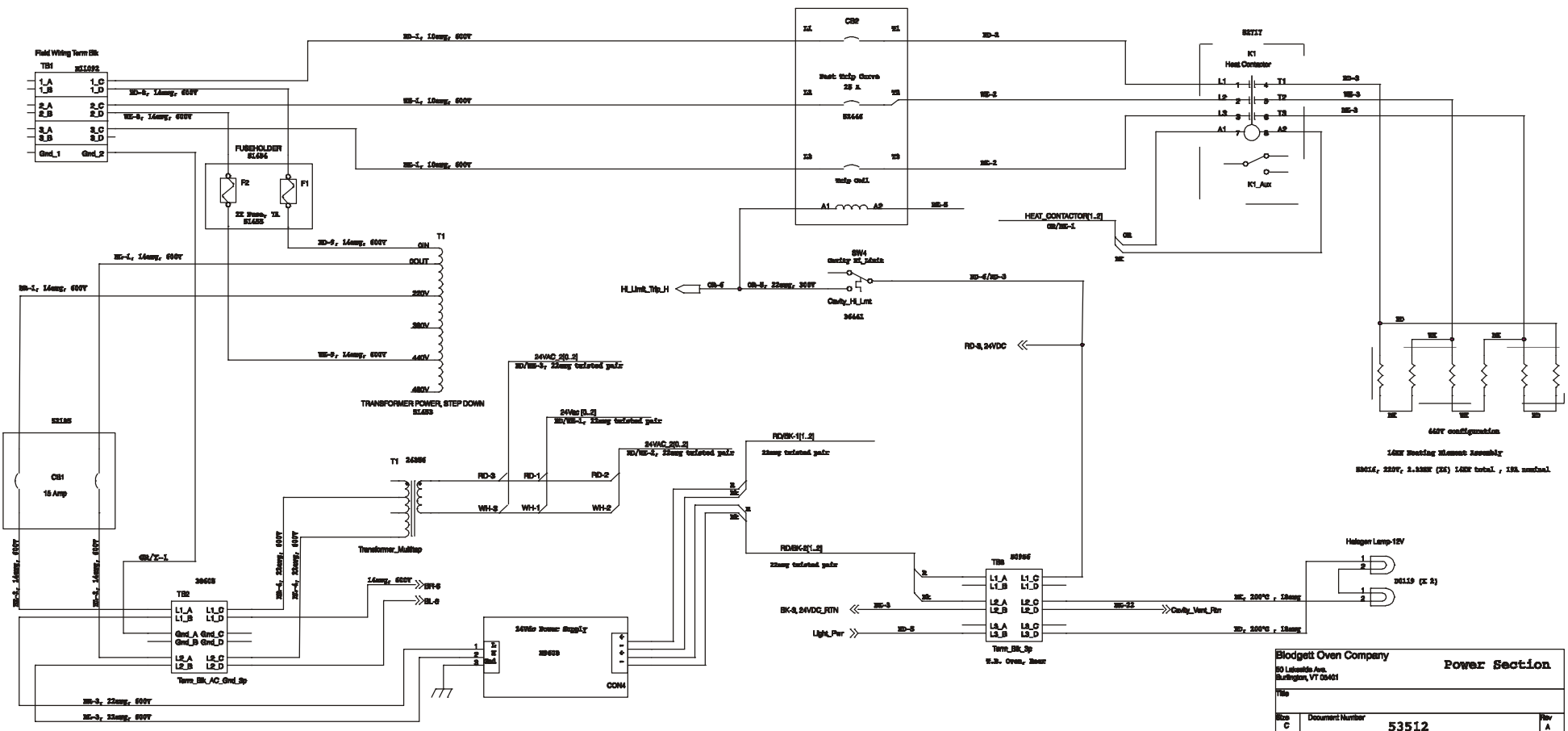
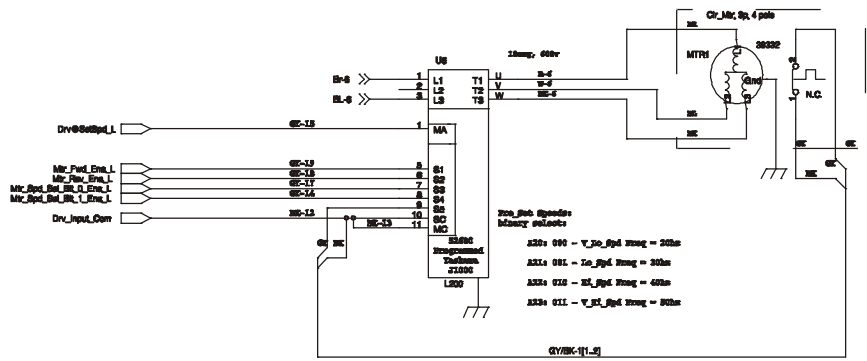
Maintenance

Probe Ohms Chart

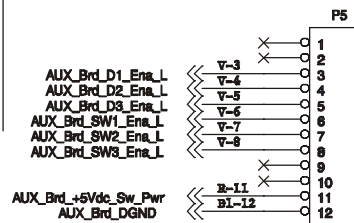
Temp	Probe Ohms (P/N 51516)
0	1000
20	1078
24	1090
30	1115
50	1195
60	1232
80	1310
93	1360

Temp	Probe Ohms (P/N 51516)
100	1386
120	1460
150	1575
180	1685
200	1758
230	1868
260	1978





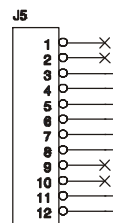
For Reference Only



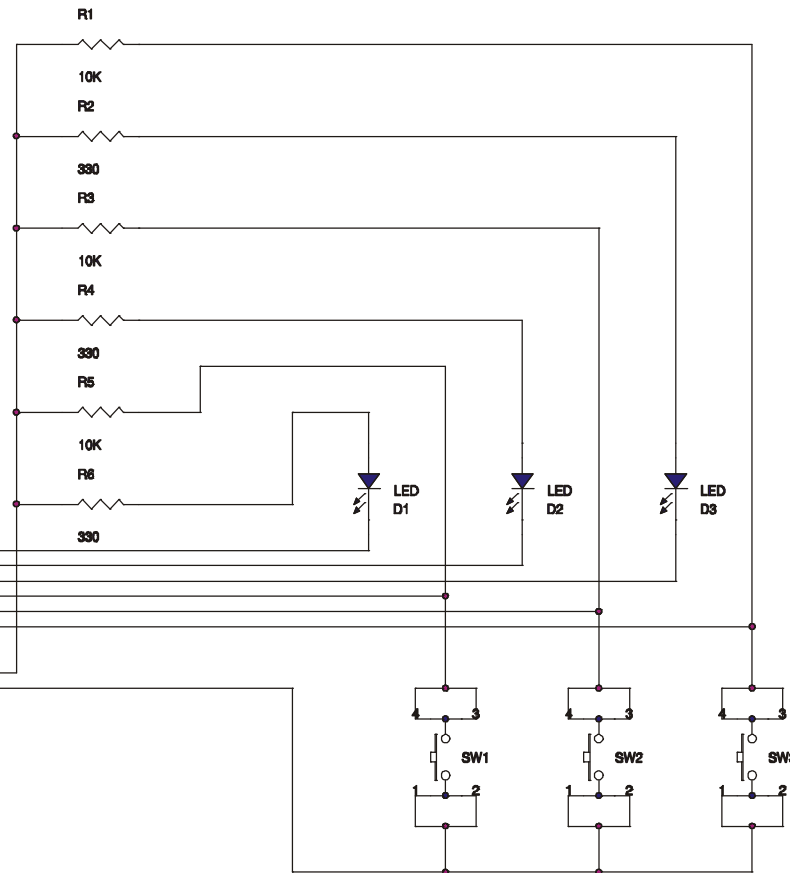
733-312

Harness PN: 50178

To VFD Controller Aux I/O



733-342
WAGO



Red LEDs - T100

Switches - MRC
#1052612, 12mm key cap

NAVSEA/SPAWAR TECHNICAL MANUAL DEFICIENCY/EVALUATION REPORT (TMDER)

INSTRUCTIONS: Continue on 8 ½" x 11" on page if additional space is needed.

1. Use this report to indicate deficiencies, problems and recommendations relating to publications.
2. For **CLASSIFIED** TMDERs see OPNAVINST 5510H for mailing requirements.
3. For TMDERs that affect more than one publication, submit a separate TMDER for each.
4. Submit TMDERs at web site <https://nsdsa.nmci.navy.mil> or mail to: **COMMANDER, CODE 310 TMDERs, NAVSURFWARCENDIV NSDSA, 4363 MISSILE WAY BLDG 1389, PORT HUENEME CA 93043-4307**

1. PUBLICATION NUMBER	2. VOL/PART	3. REV/DATE OR CHG/DATE	4. SYSTEM/EQUIPMENT ID	
5. TITLE OF PUBLICATION			6. REPORT CONTROL NUMBER (6 digit UIC-YY-any four: xxxxxx-10-xxxx)	
7. RECOMMEND CHANGES TO PUBLICATION				
7a. Page #	7b. Para #	7c. RECOMMENDED CHANGES AND REASONS		
8. ORIGINATOR'S NAME AND WORK CENTER		9. DATE	10. ORIGINATOR'S E-MAIL ADDRESS	11. TMMA of Manual (NSDSA will complete)
12. SHIP OR ACTIVITY Name and Address (Include UIC/CAGE/HULL)		13. Phone Numbers: Commercial () - DSN - FAX () -		

FOLD HERE AND TAPE SECURELY
PLEASE DO NOT STAPLE

INCLUDE COMPLETE ADDRESS

USE
PROPER
POSTAGE

FOR OFFICIAL USE ONLY

**COMMANDER
CODE 310 TMDERs
NAVSURFWARCENDIV NSDSA
4363 MISSILE WAY BLDG 1389
PORT HUENEME CA 93043-4307**

FOLD HERE AND TAPE SECURELY
PLEASE DO NOT STAPLE

S6163-CY-FSE-010
